

# The Bee's Home Magazine Page

## Rays of Sun Are Turned Into "Heat" and "Light"

By GARRETT P. SERVISS.

"Can you give me any information as to the distance from the earth that light and heat cease, and in the absence of all heat what is the temperature?"—D. E. R., New York.

In the absence of all heat the temperature is zero, not the zero of the thermometers, but what is called "absolute zero."

In other words, where there is no heat there is no temperature. Absolute zero is supposed to be about 273 degrees below the thermometric zero of the centigrade scale and about 461 degrees below the thermometric zero of the Fahrenheit scale.

Absolute zero might, imaginatively, be defined as molecular death, because a substance which has lost all temperature has necessarily lost all molecular, or internal, energy, and has become entirely inert.

Both light and heat are effects produced by motion of the molecules and atoms of which all matter consists. A molecule is "the smallest quantity of a compound substance which can exhibit the properties by which that substance is identified." An atom is one of the constituent parts of a molecule and may be defined as "the smallest quantity of simple matter which can enter into the composition of the molecule."

Except when in a state of absolute zero, the molecules of all substances are in continual motion among themselves. We can see neither the molecules nor their motion, but we can feel the molecular motion, or vibration in the sensation that we call heat. To satisfy yourself that "heat" is an internal motion among the particles, or molecules, of a body, take a hammer and pound upon a piece of iron. After a time both the hammer and the iron will become warm. They do so because their molecules have been set into greater vibration than before.

There are many sources of heat on the earth, but all of them are insignificant in comparison with the sun, which supplies nearly all the heat and light that the earth, as a whole, enjoys. This supply is furnished by vibrations, originating in the motions of the atoms and molecules composing the sun, and transmitted through the "ether" across space to the earth. The ether is a theoretical medium of which we have no knowledge except by its effects that is believed to extend through all space, and to penetrate freely through all forms of matter.

The vibrations that the ether receives from the sun and passes on to the earth and the other planets are called radiant energy, and two of the most familiar forms in which this energy is manifested we know as light and heat.

Now, you are asking the distance from the earth to light and heat cease? Evidently, from what has been said above, distance from the earth has nothing to do with the cessation or with the existence of the rays of energy from the sun. They will continue to pass farther and farther away into space, on all sides, their intensity within a given area varying inversely as the square of the distance, until they have become so widely dispersed as to be insensible. If they hit the earth, that is the earth's good luck.

Yet these rays are neither light nor heat, in our sense of those words, as long as they are simply borne onward through the ether. It is only when they strike some material substance, like the earth, that they give rise to molecular vibrations producing the sensation of light in the eye, and of heat in the organs of touch or feeling. The form that the radiations take is that of minute waves in the ether, and there is an immense variety in the length and the rapidity of vibration of these waves. Those whose length falls between about one 40,000th and one 10,000th of an inch produce the sensation of light in the eye. Those that are shorter or longer than these produce no effect upon the nerve of vision, but we are beginning to find out that some of them have other effects, for the recognition of which we seem to possess no special sense. Some of these invisible waves produce heat on striking the earth, but most of the heat-producing waves appear to be at the same time producers of light.

The ether itself is not rendered luminous and is not heated, by the passage of the sun's rays. Consequently if you could place yourself out in open space, beyond our atmosphere, you would find no diffused light around you. You would see no luminous rays. You would see the sun and the stars, but the former would appear as a brilliant round disk set in a perfectly black sky, and the stars would be points of piercing brightness, with no flicker or halo of light about them. The sun's rays falling upon your head might produce a sensation of heat, for its molecules would be set into vibration; yet the intense cold about you, and the absence of any absorbing medium to retain the heat, might, at the same time, result in your being frozen solid to the center with the suddenness of an explosion.

## "Ignorance Is Bliss" (So They Say)

(So They Say)

By Nell Brinkley

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## Genius of Penance

By S. VERE TYLER.

Apparently geniuses are advanced spirits doing penance on earth. They are, it seems, appointed by God to perform exaggerated Herculean tasks that benefit the rest of humanity. Certain it is that they are slaves to an invisible power that drives them on. Having been assigned a task, they are kept at it like galley slaves.

In many instances a genius is not even permitted to look forward to pay, for the time fixed for reward, if there is to be earthly reward, is decided for him by the invisible Power that assigned the task.

Having succeeded in pleasing—once the world, in fact, has recognized the genius, and paid for his services—the whip laid is from without as well as from within. He must go on working to supply the demand he has created. He can never shirk his duty like lesser men, while another performs his task, for no other can. He is an instrument that must be kept in tune at the sacrifice of self.

Others may fling themselves upon the sea of pleasure, live to excess, "eat, drink and be merry, for tomorrow you may die," but the genius has labor to perform for the hour, and tomorrow he is destined, through his work, to live. Even a crippled animal is relieved from work and cared for. Not so the genius. He must go on working, no matter how tortured—some even on their death beds, like Robert Louis Stevenson and Mozart.

Apart from continuous, nerve-racking, oftentimes exhausting labor, the majority of geniuses are forced to endure both mental and physical suffering. It is only necessary to cite a few instances:

Milton, at the most interesting period in his career, became blind, and had to dictate his work.

Beethoven, at the zenith of his power, became deaf, so he could not hear his own music.

Wagner had to undergo biting, humiliating poverty for many a day; later had Minna as a daily torment, and was only allowed to escape her at intervals to perform his great service for the world. Byron, with godlike beauty of face and inordinate sensitiveness, had to carry everywhere with him a club foot.

Nietzsche lived with the full consciousness that he would go mad—and he did! Oscar Wilde was shouldered with the contempt of the world, and did time on a treadmill.

Cleopatra was abandoned and sought refuge from suffering in a self-inflicted death.

Napoleon spent seven years chained up like a mad dog on a desolate island.

Julius Caesar was murdered, and expressed the anguish of his life in his words, "Et tu, Brute."



The son of Venus is fair and square. For wherever he sets a trap there he sets danger signals, too. But most folks who are skating square into a hole in the ice, in good company, are most times so far gone already that though they have eyes they cannot see! The fair, big sign looms up, square and white, with the wobbly, tired letters carefully inscribed by the chubby hand of the greatest rascal that is—

"Danger!" But a man and a maid with the gold-dust of dreams filling their eyes, the wine of elusion clouding their heads, the fire of the chase after the greatest chimera of all pulsing in their veins—how can they see a signal with a squat figure crouching behind, a-brim with intrigue; this and a sinister blue crack that fans out from the dark thin spot and the icy water beneath?

But you who are one with the man and the maid who skim straight into the thing that cycles call a "weak spot" of the scheme of things will smile, and snick a finger at the danger sign. For maybe you know that the water is as warm as Venus' bath when once you're in—and even if it isn't, you reckon you'll live through the crash!

—NELL BRINKLEY.

## Do You Know That

In a station on the Pennsylvania railway considerable trouble was experienced from rats till an electric trap in the form of an electrocuting "chair" was constructed. The "chair" consists of an iron plate with a steel spike suspended above it, both the plate and the spike being connected to two wires of an electric circuit. The spike is baited with a piece of cheese and the rodents in attempting to reach this are promptly electrocuted.

It is unlawful in Turkey to seize a man's residence for debt, and sufficient land to support him is also exempt from seizure.

In normal circumstances Canada produces about 1,000 tons of news printing paper in a day, of which 600 tons are used in the Dominion. The balance of 1,200 tons is exported.

Stockholm, Christiania, Berlin and London, in the order named, have the lowest death rates among the European cities.

Montreal has the largest flour mill in the British Empire, it turns out 5,000 barrels a day.

Baldness among Indians and negroes is almost unknown.

A new invention is designed for the control of fog signals by wireless. The signals, which are placed at various points in the Firth of Clyde, consists of Stevenson-Hoynes gas "sunas", in which a charge of acetylene and air is fired at intervals.

The steel for pen-nibs is cut into ribbons as wide as the length of one pen, and these are fed to machines which cut out the blanks, then shape them, split the points and place the maker's name on the backs.

## Read It Here—See It at the Movies

# Runaway June

By George Randolph Chester and Lillian Chester

By special arrangement for this paper a photo-drama corresponding to the installments of "Runaway June" may now be seen at the leading moving picture theaters. By arrangement made with the Mutual Film corporation it is not only possible to read "Runaway June" each day, but also afterward to see moving pictures illustrating our story. (Copyright, 1915, by Serial Publication Corporation.)

### THIRD EPISODE.

#### June Finds Work.

CHAPTER III.—(Continued.) As June peered out of her dressing alcove a middle-aged man and woman paused in a vigorous argument. This woman wanted money, and the man would not give it. Then June was called and came out and paraded slowly down between the two long rows of chairs. She had displayed perhaps half a dozen gowns when the middle-aged man and woman obstructed her passageway as she came out of the alcove. They were still in an energetic dispute about the money. A hundred dollars the woman wanted, and she had to have it! The man finally left her.

A lady from a group where a gray-mustached man with a pink face and jovial eyes was standing came over and spoke to the woman. The woman listened, her eyes following June as she walked in a beautiful black velvet dinner gown. The woman spoke to a saleslady. "I want that gown!" she snapped. "Certainly, madam," said the saleslady. "Tell her to take it off now," ordered the customer. "It's a charge account."

So June was unconsciously rushed into her alcove and divested of the black velvet gown, while the charge account went up. The gown was taken away. The woman had a girl carry it to the credit department, said she had bought the gown, didn't care for it and wanted the money, \$15.

ever, she was a good customer and her bills were always paid. The woman rejoined her friend in front of June's dressing alcove and triumphantly displayed the money. The husband of the customer came up, furious. He had been to the credit desk and discovered the deception. A little group quickly formed around the middle-aged husband and wife. It was at this moment that Blye appeared by the side of the gray mustached man and with him was Tommie Thomas! Blye quitted his head to Cunningham and said something to Tommie. She strolled with quiet evident reluctance across the floor.

"Your turn, dear," said the manageress to June and frowned in the direction of the group. "I give you everything you want," charged the man. "No woman in this town has more. You can go into any shop in New York and order what you like and I pay your bills. Yet you graft on me!"

"You give me everything but money!" shrieked the woman. I beg for every cent I get!"

To give on the one hand, and to beg on the other! It was a striking illustration of the principle which had led June away from Ned. That the woman is and must remain an object of charity, dependent upon the bounty of the man whom she marries! No matter how generous the man might be nor how generous, the principle was the same.

The gray mustached man called the manageress. "I would like to see that little white dress," he said, indicating June, who had on another frock. "Certainly," replied the manageress. She hurried over to June and said, "Come, Therese!" A warm hand caught June's wrist, and a voice said: "You're stunning! What's the fight about?"

Tommy Thomas it was. The two girls stood listening. The gray mustached man rose. "If this is the sort of attention I receive in this shop, I shall give it no more of patronage," he declared angrily to the manageress.

"What is the matter?" asked the superintendent. "Matter!" blazed Cunningham. "I've been asking this saleswoman for half an hour to let me see that little white dress," he pointed to June, "and I am ignored, sir!"

"It's a new model," explained the manageress. "I can't get her to pay any attention to me."

"Then discharge her at once!" ordered the superintendent and turned on his heel. Madam Effing walked straight over to June. "You are discharged!" she snapped. "Oh! June was stunned. "No excuses, please!" grated the manageress.

"Madam!" called the vivacious Tommy Thomas, but madam only stared at her and stalked away, while June walked into her dressing alcove to know, with sympathy for all the other girls of her position, just how it feels to be discharged.

Meantime Tommy Thomas, the look of concern fading from her handsome countenance, hurried over and joined Orin Cunningham and Gilbert Blye. The three left the department. When June emerged from her dressing alcove Madam Effing was there and without a word gave her a little yellow envelope. With this in her hand June walked out into the street, saddened with the realization that, after all, the way to independence is full of hardships and that bounty might have its advantages. Gilbert Blye was waiting for her at the corner, suave, pleasant, smiling. She had never met a man who smiled his hat with more courtly grace than he. He asked if he might walk with her a little way, and she saw no reasonable excuse to refuse him after his consideration of the morning. He sympathized with her, and he extended his walk to the door of her lodgings. He held her hand a moment overlong in parting, and the wheezing Mrs. Boales, her cold eye looking from the area window, saw him bending over her in smiling persuasion.

Bill Wolf, the flattest and wisest of Honoria's detectives, later rang the Blye

bell and bulged back to the dining room in excitement.

"Got him!" announced Bill. "Is she with him?" demanded Honoria. "I don't know. My partners are watching the front and back doors. Come!" Honoria bundled the flat, wide detective into her electric and started machine. "Where?" she majestically demanded. "Riverside drive. I'll show you the place."

"Is he still in Blinky?" demanded Bill Wolf, tumbling out of the machine and landing right end up. Blinky Peters was too good a detective to answer in words. He gave an upward toss of his round head and a wind of his fishlike eye and walked into the building with an air of not having seen Bill Wolf at all.

"Fifth!" ordered Blinky, leaning over to whisper the magic word mysteriously into the ear of the curly haired elevator boy. The boy did not mind. He was used to all sorts. He sent up the elevator with a jerk. Out at the fifth floor. First door to the right. Now! A ring at the doorbell. Hush!

The door swung open, and immediately Bill Wolf pushed in. The others crowded after him.

"There he is, ma'am!" shouted Bill, plunging into the next room, and Honoria Blye saw in June Warner's drawing room the tall, lean, lanky detective with the sparse black beard, who was the caricature of her handsome husband! Ned Warner followed from the reception room.

(To Be Continued Tomorrow.)

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