

financial considerations. It is evident that in foreign parts, or in any place where there is a difficulty in disposing of the ammonia, the obtaining of the same in a dry form offers several advantages as compared with having it as a weak solution.

RECONVERSION OF NITRO-GLYCERIN INTO GLYCERIN.

By C. L. BLOKAM.

THE following experiments on this subject appear to possess some interest at the present moment:

1. Nitro-glycerin was shaken with methylated alcohol, which dissolves it readily, and the solution was mixed with an alcoholic solution of KHS (prepared by dissolving KHO in methylated spirit, and saturating with H₂S gas). Considerable rise of temperature took place, the liquid became red, a large quantity of sulphur separated, and the nitro-glycerin was entirely decomposed.

2. Nitro-glycerin was shaken with a strong aqueous solution of commercial K₂S. The same changes were observed as in 1, but the rise of temperature was not so great, and the liquid became opaque very suddenly when the decomposition of the nitro-glycerin was completed.

3. The ordinary yellow solution of ammonium sulphide used in the laboratory had the same effect as the K₂S. In this case the mixture was evaporated to dryness on the steam bath, when bubbles of gas were evolved, due to the decomposition of the ammonium nitrite. The pasty mass of sulphur was treated with alcohol, which extracted the glycerin, subsequently recovered by evaporation. Another portion of the mixture of nitro-glycerin with ammonium sulphide was treated with excess of PbCO₃ and a little lead acetate, filtered, and the ammonium nitrite detected in the solution. These qualitative results would be expressed by the equation—



which is similar to that for the action of potassium hydro-sulphide upon gun-cotton.

4. Flowers of sulphur and slaked lime were boiled with water, till a bright orange solution was obtained. This was filtered, and some nitro-glycerin powdered into it. The reduction took place much more slowly than in the other cases, and more agitation was required, because the nitro-glycerin became coated with sulphur. In a few minutes, the reduction appearing to be complete, the separated sulphur was filtered off. The filtrate was clear, and the sulphur bore hammering without the slightest indication of nitro-glycerin.

This would be the cheapest method of decomposing nitro-glycerin. Perhaps the calcium sulphide of tank-waste, obtainable from the alkali works, might answer the purpose.—*Chemical News.*

CARBONIC ACID AND BISULPHIDE OF CARBON.*

By JOHN TYNDALL, F.R.S.

CHEMISTS are ever on the alert to notice analogies and resemblances in the atomic structure of different bodies. They long ago indicated points of resemblance between bisulphide of carbon and carbonic acid. In the case of the latter we have one atom of carbon united to two of oxygen, and in the case of the former one atom of carbon united to two of sulphur. Attempts have been made to push the analogy still further by the discovery of a compound of carbon and sulphur analogous to carbonic oxide, but hitherto, I believe, without success. I have now to note a resemblance of some interest to the physicist, and of a more settled character than any hitherto observed.

When, by means of an electric current, a metal is volatilized and subjected to spectrum analysis, the "reversal" of the bright band of the incandescent vapor is commonly observed. This is known to be due to the absorption of the rays emitted by the vapor by the partially cooled envelope of its own substance which surrounds it. The effect is the same in kind as the absorption by cold carbonic acid of the heat emitted by a carbonic oxide flame. For most sources of radiation carbonic acid is one of the most transparent of gases; for the radiation from the hot carbonic acid produced in the carbonic oxide flame it is the most opaque of all.

Again, for all ordinary sources of radiant heat, bisulphide of carbon, both in the liquid and vapor form, is one of the most diathermanous bodies ever known. I thought it worth while to try whether a body reputed to be analogous to carbonic acid, and so pervious to most kinds of heat, would show any change of deportment when presented to the radiation from hot carbonic acid. Does the analogy between the two substances extend to the vibrating periods of their atoms? If it does, then the bisulphide, like the carbonic acid, will abandon its usually transparent character, and play the part of an opaque body when presented to the radiation from the carbonic oxide flame. This proved to be the case. Of the radiation from hydrogen, a thin layer of bisulphide transmits 90 per cent., absorbing only 10. For the radiation from carbonic acid, the same layer of bisulphide transmits only 25 per cent., 75 per cent. being absorbed. For this source of rays, indeed, the bisulphide transcends, as an absorbent, many substances which, for all other sources, far transcend it.

THE HAIR, ITS USE AND ITS CARE †

By JOHN V. SHOEMAKER, A. M., M. D., Physician to the Philadelphia Hospital for Skin Diseases.

THE object of this paper is to briefly describe the hair and its important functions, and to suggest the proper manner of preserving it in a healthy state.

I know full well that much has been written upon this useful part of the human economy, but the constant increase of bald heads and beardless faces, notwithstanding all our modern advancement in the application of remedies to the cure of disease, prompts me to point out to you the many ways of retaining, without medication, the hair, which is a defense, ornamentation, and adornment to the human body.

[Dr. Shoemaker here gave an interesting history of the growth and development of the hair and its uses, which we are compelled to omit. Then, proceeding, he said:] Now, the hair, which fulfills such an important function in the adornment and health of the body, requires both constitutional and local care to keep it in its normal, healthy state. When I say constitutional care, I mean that the various organs of the body that assist in nourishing and sustaining the hair-forming apparatus should, by judicious diet, exer-

cise, and attention to the nervous system, be kept healthy and sound, in order that they in turn may assist in preserving the hairs in a vigorous condition.

In the first place, that essential material, food, which is necessary to supply the waste and repair of all animal life, should be selected, given, or used according to good judgment and experience.

Thus, mothers should feed their infants at regular intervals according to their age, and not permit them to constantly pull at the breast or the bottle until the little stomach becomes gorged with food, and some alimentary disorder supervenes, often setting up a rash and interfering with the growth and development of the hair. It is likewise important, in case the baby must be artificially fed, to select good nutritious food as near as possible like the mother's—cow's milk, properly prepared, being the only recognized substitute. Care and discretion should likewise be taken by parents and nurses, after the infant has developed into childhood, to give simple, substantial, and varied food at regular periods of the day, and not in such quantities as to overload the stomach. Children need active nutrition to develop them into robust and healthy men and women; and it is from neglect of these important laws of health, and in allowing improper food, that very often bring their results in scald head, ring-worm, and scrofula, that leave their stamp in the poor development of the hair. With the advent of youth and the advance of years, food should be selected and partaken of according to the judgment and experience of its acceptable and wholesome action on the consumer.

The meals should also be taken at regular intervals. At least four hours should be left between them for the act of digestion and the proper rest of the stomach.

It is, on the contrary, when the voice of nature has been stifled, when judgment and experience have been set aside, that mischief follows; when the stomach is teased and fretted with overloading, and the food gulped down without being masticated, gastric and intestinal derangement supervenes, which is one of the most prolific sources of the early decay and fall of the hair.

The nervous system, which is one of the most important portions of the human structure, and which controls circulation, secretion, and nutrition, often by being impaired, plays a prominent part in the production of baldness. Thus, it has been demonstrated by modern investigation that the nerves of nutrition, by their defective action, are often the cause of thinning and loss of hair. The nutritive action of a part is known to suddenly fail, the hair-forming apparatus ceases to act, the skin changes from a peculiar healthy hue to a white and shining appearance, and often loses at the same time its sensibility; the hairs drop out until very few remain, or the part becomes entirely bald. It is the over-taxing of the physical powers, excessive brain work, the exacting demands made by parents and teachers upon children's mental faculties, the loss of sleep, incessant cares, anxiety, grief, excitement, the sudden depression and exaltation of spirits, irregular and hastily bolted meals, the lack of rest and recreation, the abuse of tobacco, spirits, tea, coffee, and drugs of all forms, that are fruitful sources of this defective action of the nerves of nutrition, and consequent general thinning and loss of hair.

The hair, particularly of the head, should also receive marked local attention. In reference to the use of coverings for it, I know of no better rules than those which I laid down in my chapter on clothing in "Household Practice of Medicine" (vol. i., p. 218, William Wood & Co., New York), in which I state that the head is the only part of the body so protected by nature as to need no artificial covering.

The stiff hats so extensively worn by men produce more or less injury. Premature baldness most frequently first attacks that part of the head where pressure is made by the hat. It is, indeed, a pity that custom has so rigidly decreed that men and women must not appear out of doors with heads uncovered. It would be far better for the hair to be bare-headed were the rule, and to wear a hat the exception.

Since we cannot change our social regulations in this respect, we should endeavor to render them as harmless as possible.

The forms of hats that are least injurious are: for Winter, soft hats of light weight, having an open structure, or pierced with numerous holes; for Summer, light straws, also of open structure.

As regards the head-covering of women, the fashions have been for several years favorable to proper form. The bonnet and hat have become quite small, and cover but little of the head. This beneficial condition, however, is in part counterbalanced by the weight of false curls, switches, puffs, etc., by the aid of which women dress the head. These, by interfering with evaporation of the secretions, prevent proper regulations of the temperature of the scalp, and likewise lead to the retention of a certain amount of excrementitious matter, both of which are prolific sources of rapid thinning and loss of hair in women.

False hair has likewise sometimes been the means of introducing parasites, which give rise to obstinate affections of the scalp.

Cleanliness of the entire surface of the skin should next demand attention, and that should be done by using water as the medium of ablution. It is a well-known physiological law that it is necessary, in order to enable the skin to carry on its healthful action, to have washed off with water the constant cast of scales which become mingled with the unctuous and saline products, together with particles of dirt which coat over the pores, and thus interfere with the development of the hairs. Water for ablution can be of any temperature that may be acceptable and agreeable, according to the custom and condition of the bather's health. Many chemical substances can be combined with water to cleanse these effete productions from the skin. Soap is the most efficacious of all for cleanliness, health, and the avoidance of disease. Soap combines better with water to render these unctuous products miscible, and readily removes them thoroughly from the skin. The best variety of soap to use is the pure white soap, which cannot be so easily adulterated by coloring material, or disguised by some perfume or medicinal substance. Ablution with soap and water should be performed once or twice a week at least, particularly to the head and beard, in order to keep open the hair tubes so that they may take in oxygen, give out carbon, carry on their nutrition, and maintain the hairs in a fine, polished, and healthy condition. In using water to the scalp and beard, care should be taken not to use soap-water too frequently, as it often causes irritation of the glands, and leads to the formation of scurf. It is equally important to avoid using on the head the daily shower-bath, which, by its sudden, rapid, and heavy fall, excites local irritation, and, as a result, loss of hair quickly follows. In case the health demands the shower-bath, the hair should

be protected by a bathing cap. The most acceptable time to wash the hair, to those not accustomed to doing it with their morning bath, is just before retiring, in order to avoid going into the open air or getting into a draught and taking cold. After washing, the hair should be briskly rubbed with rough towels, the Turkish towel heated being particularly serviceable. Those who are delicate or sick, and fear taking cold or being chilled from the wet or damp hairs, should rub into the scalp a little bay rum, alcohol, or oil, a short time after the parts have been well chafed with towels. The oil is particularly serviceable at this period, as it is better absorbed, and at the same time overcomes any dryness of the skin which often follows washing.

It might be well to add in this connection that I have frequently been consulted, by those taking salt-water baths, as to the care of the hair during and after the bath. If the bather is in good health, and the hair is normal, the bather can go into the surf and remain at least fifteen minutes, and on coming out should rub the hair thoroughly dry with towels.

Ladies should permit it remain loose while doing so, after which it can be advantageously dressed.

It is, however, often injurious to both men and women having some wasting of the hair to go into the surf without properly protecting the head; the sea water has not, as is often thought, a tonic action on the scalp; on the contrary, it often excites irritation and general thinning. Again, it is most decidedly injurious to the hair for persons to remain in the surf one or two hours, the hair wet, and the head unprotected from the rays of the sun. This latter class of bathers, and those who hurriedly dress the hair wet, which soon becomes mouldy and emits a disagreeable odor, are frequent sufferers from general loss and thinning of the hair.

An agreeable and efficient adjunct after ablution, which I have already referred to, is oil. Oil has not only a cleansing action upon the scalp, but it also overcomes any rough or uneven state of the hair, and gives it a soft and glossy appearance.

The oil of ergot is particularly serviceable in fulfilling these indications, and, at the same time, by its soothing and slight astringent action upon the glands, will arrest the formation of scurf. In using oil, the animal and vegetable oils should always be preferred, as mineral oils, especially the petroleum products, have a very poor affinity for animal tissues.

Pomatum is largely used by many in place of oil, as it remains on the surface and gives a full appearance to the hairs, thus hiding, sometimes, the thinness of the hair.

It will do no harm or no special good if it contains pure grease, wax, harmless perfume, and coloring matter, but it is often highly adulterated, or, the fat in it decomposing, sets up irritation on the part to which it is applied. I therefore always advise against its use.

The comb and brush are also agents of the toilet by which the hair is kept clean, vigorous, and healthy. The comb should be of flexible gum, with large, broad, blunt, round, and coarse teeth, having plenty of elasticity. It should be used to remove from the hairs any scurf or dirt that may have become entangled in them, to separate the hairs and prevent them from becoming matted and twisted together.

The fine-tooth comb, made with the teeth much closer together, can be used in place of the regular toilet comb just named when the hair is filled with very fine particles of scurf, dirt, or when parasites and their eggs infest the hairs. It should, however, always be borne in mind that combs are only for the hair, and not for the scalp or the skin, which is too often torn and dug up by carelessly and roughly pulling these valuable and important articles of toilet through the skin as well as the hair.

The brush with moderately stiff whalebone bristles may be passed gently over the hair several times during the day, to brush out the dust and the dandruff, and to keep the hair smooth, soft, and clean; rough and hard brushing the hair with brushes having very stiff bristles in them, especially the metal or wire bristles, is of no service, but often irritates the parts and causes the hair to fall out. [Dr. Shoemaker then denounced the use of the so-called electric brush, saying its use was injurious, as also was the effort to remove dandruff by the aid of the comb and brush. Continuing, he remarked:] And now the question arises, Should the hair be periodically cut? It may be that cutting and shaving may for the time increase the action of the growth, but it has no permanent effect either upon the hair-bulb or the hair sac, and will not in any way add to the life of the hair.

On the contrary, cutting and shaving will cause the hair to grow longer for the time being, but in the end will inevitably shorten its term of life by exhausting the nutritive action of the hair-forming apparatus. When the hairs are frequently cut, they will usually become coarser, often losing the beautiful gloss of the fine and delicate hairs. The pigment will likewise change—brown, for instance, becoming chestnut, and black changing to a dark brown. In addition, the ends of very many will be split and ragged, presenting a brush-like appearance. If the hairs appear stunted in their growth upon portions of the scalp or beard, or gray hairs crop up here and there, the method of clipping off the ends of the short hairs, of plucking out the ragged, withered, and gray hairs, will allow them to grow stronger, longer, and thicker.

Mothers, in rearing their children, should not cut their hair at certain periods of the year (during the superstitious time of full moon), in order to increase its length and luxuriance as they bloom into womanhood and manhood. This habit of cutting the hair of children brings evil in place of good, and is also condemned by the distinguished worker in this department, Professor Kaposi, of Vienna, who states that it is well known that the hair of women who possess luxuriant locks from the time of girlhood never again attains its original length after having once been cut.

Pincus has made the same observation by frequent experiment, and he adds that there is a general opinion that frequent cutting of the hair increases its length; but the effect is different from that generally supposed. Thus, upon one occasion he states that he cut off circles of hair an inch in diameter on the heads of healthy men, and from week to week compared the intensity of growth of the shorn place with the rest of the hair. The result was surprising to this close and careful observer, as he found in some cases the numbers were equal, but generally the growth became slower after cutting, and he has never observed an increase in rapidity.

I might also add that I believe many beardless faces and bald heads in middle and advancing age are often due to constant cutting and shaving in early life. The young girls and boys seen daily upon our streets with their closely cropped heads, and the young men with their clean-shaven

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