aware of the desirability of the babe's *pruging* away its meconium: they are aware also that the colostrum of the mother's breast is not *food*. They therefore give the child purgative medicines, and refuse it its mother's breast for three days, while the colostrum is being artificially squeezed out, the child meanwhile being fed on raw sugar-cane juice, or suckled on the watery milk of some aunt or grandmother. Many of the native women never "go dry." Fevered and "caked" breasts are a common result, with frightful mammary abscesses. My patience has often been tried when I have said to some of the old hags:—"Yes, I too know that colostrum is not *food*, but it *is* medicine—the very medicine the child needs as a purge, and which God has put in the mother's breast for that express purpose—which should promptly be extracted from her breast, and which can best be extracted by her child's lips. *g.* Native women are not bandaged for the support of the abdomen's post-natal, flaccid walls. They are expected to arise, perhaps, the very day of parturition, and resume their usual labors. Very common are uterine displacements, and subsequent sterility, which the polygamous father resents. He does not see why the woman who has born him one child should not bear him more. Her inability to do so, he punishes with neglect, unkindness, or severity.

h. An argument given by polygamists for the system is their assumed necessity for having additional women with whom to cohabit, while the one who has just become a mother is nursing her child. Children are not weaned till they are three or four, or even more, years of age. During this time the mother avoids sexual congress, on the plea that her milk may be "spoiled" for her babe, on whom she now lavishes her affection, having had none for the father. Yet that milk, in due time, becomes, thin, watery, and void of sufficient nutriment for the child that has developed most of its first set of teeth. The child loses its infantile chubbiness: becomes thin; and breaks out with eczema and other sores; and its joints become abnormally large.

Among the most common results of African child-marriage, I observed: 1. Rupture in the genital region, either from the little mother's bodily structures being not fully developed, or from outside force used in aid of parturition. 2. Displacements of the uterus. 3. Sterility. 4. Ovarian tumors. 5. Uterine ulcers. 6. Dysmenorrhœa and menorrhagia. 7. Premature loss of good looks, and early appearance of haggard old age.

THE QUALITY OF COMPRESSED AIR FOR SPRAYS AND INHALATIONS.

BY D. LICHTY, M.D.,
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Asepsis is now in the zenith of its usefulness and has demonstrated beyond controversy its beneficence to all unfortunates who have to experience the surgeon's dextrous touch or feel his keener blade; every newly made wound is carefully guarded against the ingress of air, of any kind, and quickly sealed against it; the surgeon, gynecologist or accoucheur goes about his work now, with a comfortable assurance that the painstaking physician must envy in conscious helplessness when he recognizes the environment in which he must combat disease.

There is an avenue however, which for the introduction of disease and death growing germs has no parallel and no excuse for its existence, other than that it is here, and no one has protested against it.

The allusion made, is in regard to the *quality* of air usually used in the compressed air receivers of those who treat diseases of the nose, throat and lungs by this means; all the air pumps I have observed offered for sale or in physicians' offices—and I have taken special pains to see as many of them as possible, are situated on the floor of the doctor's office, in not an overclean corner from which the air is drawn into the pump and thence stored in the reservoir to be afterwards projected with a pressure of from fifteen to twenty pounds into the diseased larynx or pharynx of the innocent patron whose inflamed crypts are deep and open wells for the speedy reception, and successful propagation of any of the germ diseases; with just the right factors of moisture and heat to develop them all; or, if drawn into the deeper structure of the lungs to mingle with, or become a portion of the residuary air, a sufficient period would ensue before again exhaled, for the successful incubation of almost any germ, and a nidus for dangerous disease be formed.

To ease my conscience of this offense against my patients I had a mechanic of the Air Brush Co., of this city, at my suggestion, construct for me a small oscillating pump which is run by a one-eighth horse power electric motor, that draws the air from out of doors; first through a five inch funnel shaped chamber, whose open end is covered with wire gauze and its inside loosely packed with asbestos wool to make a complete filter; this filter chamber is fastened at the outside top of a window sash of an upstairs office, and is connected by a rubber tube, larger than would seem necessary—to reduce resistance to a minimum—to the inlet valve of the pump, and is thence, at the return of the piston, forced into the air receiver for future use; by this means all the air comes from outside, is filtered, and it is claimed, that cleaner air is obtained than by the pumps generally located on doctors' dusty office floors.

The mechanical difficulties necessary to adjust any air pump to a similar filter system are not great, or expensive; and it is hoped that the physician will be enabled to use as aseptic air to inhale, or to spray diseased throats as the surgeon does to douche his patients' wounds.

A STUDY OF THE CHEYNE-STOKES RESPIRATION.

BY SAMUEL WOLFE, M.D.,
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The patient, aged 65, an employee of the City Gas Department had for many years, when exposed to breathing illuminating gas, in the pursuit of his occupation been subject to attacks during which he lost consciousness, but after a short period of half an hour or an hour recovered and was able to resume his work. About three weeks prior to the time when the present observation was made he had suffered from one of these attacks, of more than usual severity and duration, and immediately thereafter was confined to his room for four or five days, with urgent dyspnoea and severe bronchial symptoms. Later on there was continued cough, and great rest-

lessness, and threatened cardiac failure. After partial recovery he again relapsed with great dyspnoea, and gradually became delirious, and during a portion of the time apathetic and lethargic. The Cheyne-Stokes respiration then appeared accompanied by a pulse of 112, the temperature being normal. A cycle of respirations occupied 55 seconds there being 27 respirations. The period occupied by the rising respirations was 25 to 30 seconds by the declining respirations 15 seconds. The number in each of these phases was about the same—14, making the succession during the declining period nearly twice as rapid as during the rising period. The pause lasted from 10 to 15 seconds. In this phase there was no perceptible alteration in the rate or character of the cardiac action, and no alteration in the pupils. Coughing during the cycle, did not influence its duration, nor any of its intrinsic characters. When aroused from his somnolence, which could be easily effected, there was no change in the cycle, except that the phase of decline was lengthened by a few additional respirations, during which there were no chest movements, but air could be heard to enter the extreme lower parts of the lung in jerky momentary pumps. The pause was of course correspondingly shortened. Otherwise the pause was a period of absolute stillness, so far as respiratory sounds were concerned, but as already remarked the cardiac sounds were in no respect altered. The patient died ten days later. The breathing during the whole period was closely allied to the Cheyne-Stokes type, but at no time was it found as typical subsequent to the above observation, as at that time.

CAFFEINE AND THE QUESTION OF ITS ISOMERISM.

Read in the Section of Materia Medica and Pharmacy, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY ALBERT B. PRESCOTT, M.D.,
OF ANN ARBOR, MICH.

In chemistry, caffeine is a body of distinctive molecular character, the subject of active research within the past ten years. In physiology it is bound to be of increasing interest that caffeine, the chosen adjunct of food, holds a remarkable relation to uric acid, an excretory carrier of nitrogen. In dietetics it is of wide import that the beverage plants of the world owe their effects in great measure to caffeine. In pharmacognosy it is worthy of attention that uncertain combinations of caffeine are in medicinal use. In these several studies it is desirable to settle the chemical question, whether caffeine be capable of isomerism or not.

This is not a question that has been raised by chemists; nor is there at present any chemical evidence, that I am aware of, for so much as a suggestion of the isomerism of caffeine. Pharmacologists have virtually raised this question, though they have not defined it as one of isomerism. And there is a great extent of medical opinion and lay opinion that, whatever chemists may say, the alkaloid of coffee does not produce the same effect upon the nervous system that is produced by the alkaloid of tea. If this somewhat widespread opinion, though not well defined, be well grounded, the chemist ought to be able to account for it. On one point the chemist is clear, if there be a caffeine in tea in itself not of the

same physiological effect as the caffeine in coffee, then these bodies are not chemically identical. Then, both being caffeine, that is, trimethyl xanthines, it follows that the one must be isomeric with the other. Before this point is reached, however, there is a great deal for chemical analysis to do, and something for pharmacology to do.

There are five beverage plants, growing in different quarters of the earth, all largely adopted into use by uninstructed man, as a restorative from fatigue and a stimulant with food, and each of these plants contains an abundance of the body named caffeine. The body has been found as a slight or inconstant constituent of a few other plants, all of them adjuncts of food.¹ It was found in coffee in 1821; in tea in 1827; in guarana in 1840; in the maté of Paraguay in 1843; and in the kola of South Africa in 1865. In 1838 Jobst and Mülder declared theine to be identical with caffeine. As soon as an alkaloid was found in guarana, in maté and in kola, in each instance the body was reported to be caffeine, and there have been no chemical reports to the contrary. The names, theine and guaranine, have fallen into disuse, and no other name than caffeine has been given to the body derived from maté or kola.

This one body, from five vegetable sources, is one of strongly marked chemical character. It is clearly determinate in character, more so than the most of the alkaloids are, and a body built altogether unlike them. Indeed, it is well within the control of synthetic chemistry. It is liable to be put upon the market as an artificial product. As an artificial body, if properly purified, it should be not an imitation but a veritable reproduction of the natural article. It is becoming probable, however, that this body, the chief alkaloid of five plants, is not the only one existing in them. Traces, at least, of two or more homologues of caffeine have been found in certain teas. There is need of analysis for these homologues, as lesser constituents. The presence of alkaloids accompanying caffeine, as codeine accompanies morphine, is to be put out of the way. Then there will be a clear field for the question of isomerism between the chief alkaloid of one beverage plant and the chief alkaloid of another, such as the difference between atropine and hyoscyamine.

As to the isomerism of caffeine, its probability can be denied only by full study of all research hitherto done on the molecular constitution of this group of bodies. The possibilities of isomerism are coming in greater number into view, as science advances. When the chemist believed himself able to find the arrangement of atoms within the molecule as truly as the order of the fingers upon his hand he seemed to have reached a limit of isomerism. Then it appeared that nature had not stopped at this limit. Whereupon the chemist bethought himself that the order of five fingers as they face on the one hand is

¹ Caffeine occurs in small amount in cacao beans, according to Schmidt (1883), theobromine being, as is well known, the principal alkaloid. The U. S. Department of Agriculture, in Division of Botany, has lately published (Bulletin No. 14, 1891) descriptions of the *Ilex cassine*, growing from Virginia to Texas, and used by the aborigines as a beverage on festal occasions. Prof. E. P. Venable found it to contain caffeine 0.27 per cent.; tannins, 7.39 per cent.; total nitrogen, 0.73 per cent. This plant is another species of the maté, *Ilex paraguensis* (Am. Jour. Pharm., 57, 389). The South African "bush tea," used for a beverage, consists of species of *Cyclopodia*. Three of these species were examined by Greenish in 1881 (Phar. Jour. Trans., [3] 10, 217-221) for caffeine, and none was found. Another species was examined for caffeine by Church in 1870 (Chem. News, 22, 2), and none was found. A few months ago a small sample of a leaf stated to be a species of *Cyclopodia*, and a "bush tea" from South Africa, strayed to my laboratory. Analyzed by Mr. Gombert it was found to contain caffeine. A further sample has been sent for.