cording to Mr. Smith there are several explanations of this popular indifference. The mistaken belief that the subject is abstruse and beyond comprehension; incredulity as to the possibility of reforming criminals; aversion to the criminal as an enemy of mankind beyond the pale of sympathy; the idea that repression of crime is a function of government and outside the scope of individual responsibility—all these causes contribute to lead the public to dismiss the whole subject in favor of other matters believed to be more important.

The controlling cause, however, of the popular indifference, beyond all of those already mentioned, is the utter failure of the public to grasp the importance of the subject and to comprehend how enormous is the burden and how terrific the danger with which crime oppresses the world. It is therefore thought that if an estimate as approximate as possible is made of the cost of crime in dollars and cents, and if the general population is by these means impressed with a clear conviction that it is a question which closely concerns their own pockets, this apathy may give place to a practical interest. Of course to say unhesitatingly what share of public taxation is properly chargeable to crime is wholly impracticable, as crime exerts its influence to a greater or less extent upon every department of life.

Mr. Smith thinks the most hopeful method of reaching a near estimate to be that of analyzing the statistics of certain cities or towns where the figures are known to be accurate and complete; and when definite conclusions have been drawn from them, it may reasonably be inferred that the same conclusions apply to other cities and towns similarly situated. For this purpose typical cities, widely separate from each other, and each one the central point of a large section of country of which it is fairly representative, have been selected, such as New York, Cleveland, Chicago, St. Louis, San Francisco, Richmond, Charleston, Savannah, and New Orleans.

The general result of an analysis of the fiscal reports of these cities is as follows: The cost of crime included in taxation in the city of New York gives an average charge of over \$6 for each individual in its population; in San Francisco about \$5; in the other cities named the per capita tax runs with slight variation from \$3 to \$3.50, including county taxation, \$4 to \$4.50 for each inhabitant. The final computation of the annual cost of crime taxation in the United States is placed at the conservative figures given below: City and county taxation chargeable to crime: 30,000,000 inhabitants of cities at per capita rate of \$35, \$105,000,000. Town and county taxation chargeable to crime: 45,000,000 inhabitants of the open country at per capita rate of \$1, \$45,000,000. Federal and State taxation chargeable to crime: not less than \$50,000,000. Total, \$200,000,000. This sum, immense as it is, merely represents an outlay in the prevention of crime. Mr. Smith further estimates the annual income of criminals to average \$400,000,000, which, added to the yearly taxation caused by crime, gives a total of \$600,000,000. This amount almost makes the head reel, and should have the effect of convincing unthinking members of the community that it would be well if they were to insist upon prison reforms and upon the abolition of methods and abuses existing in many parts of the United States. We shall have criminals always with us, as we have the poor, but at the same time there can be no doubt that many sinners may be reclaimed from a life of crime by treatment conducted on scientific principles.—New York Medical Record.

GLUCOSIDE CHARACTERIZING THE GERMINATIVE PERIOD OF THE BEECH.*

By M. P. TAILLEUR.

WHEN the hypocotyledonous axis of a beech in germination is crushed, the odor of wintergreen essence is perceived. This essence consists almost entirely of methyl-salicylic ether. It is known that, to obtain it, it is distilled in water from the stems and leaves of the *Gaultheria procumbens*, and that its production is due to the action of a diastase on a glucoside. The presence of a soluble ferment and of a glucoside has been noticed in various plants. The fact that I have pointed out above with regard to the beech, and which has not been remarked before, rendered probable the existence of like substances in plants of this species. To verify this, it was indispensable to prove the existence of a glucoside and of a diastase, and to characterize the salicylic acid.

To isolate the glucoside on one side and the soluble ferment on the other, I operated in the following manner:

I collected two lots of young beeches. For the first lot, I cut up without crushing, the hypocotyledonous axes in little pieces and placed them in concentrated alcohol of 95 deg., boiling. Every diastase susceptible of decomposing a glucoside was destroyed. The boiling was prolonged about twenty minutes; then the whole was kept for 24 hours at a temperature of about 50 deg. on the water bath. The alcohol was thus able to penetrate into the tissues and completely dissolve the glucoside. It was filtered and the liquid evaporated slowly at a temperature not passing 60 deg. Thus a syrupy glucoside, reddish brown, was obtained, which possessed no odor similar to that of wintergreen essence.

For the second lot, I triturated the hypocotyledons in alcohol of 15 deg. cold, and left them to macerate for some hours. I expressed the juice and submitted the residue to the same treatment twice again. All the glucoside was removed by the alcohol, and the diastase remained in the pulp obtained. This pulp exhales no characteristic odor. If, now, I dilute with a few drops of water a small quantity of the syrupy extract obtained with my first lot of plants, and if I add to it a slight quantity of the residue furnished by the second lot, I perceive immediately the characteristic odor of wintergreen essence; that is to say, of methyl-salicylic ether. This mixture also contains glucose, for it reduces very actively the Fehling liquor.

There is now no doubt of the presence of a glucoside, which has been decomposed by a diastase. This glu-

* Paper presented to the Academie des Sciences.

coside is the same as that of the *Gaultheria procumbens*.

It is easy to reveal the existence of salicylic acid in the shoots of the beech crushed in water. In this state they were left to macerate for two or three hours; then a certain quantity of water was added and the whole distilled. The product obtained emits the odor of methyl-salicylate. To identify this product chemically, a few drops of soda lixivium were added to the distilled liquor, producing the saponification of the ether. If a complete saponification is desired, it is necessary to prolong the action for at least 24 hours, at a temperature of about 50 deg. Then there is added, drop by drop, sulphuric acid, to neutralize the soda and to render the liquid slightly acid. The salicylic acid being thus set free, a few cubic centimeters of this liquor were then treated with ferric perchloride. A beautiful violet color appeared.

On the other hand, the same liquor treated with ordinary ether, leaves to this ether all the salicylic acid. By slow and spontaneous evaporation of this dissolvant, the acid was obtained in the crystalline form. By dissolving in water a small quantity of these crystals and subjecting them to the action of ferric perchloride, the same violet color was produced.

The glucoside of the beech is formed at the beginning of the germination, for it does not exist in the seed, and it quickly disappears during the first year when the shoot has arrived at a certain stage of development. It is localized in the hypocotyledonous axes, with a little, also, at the top of the root. It does not exist in the cotyledons, or in the ordinary stems and leaves. It can now be said that the presence of this body characterizes the germinative period of the beech.

It is known that during the germination the nutritive substances of the cotyledons are communicated to the hypocotyledons, where they are transformed before serving in the development of the plant. It is also known that the ratio of the volume of carbonic acid emitted to the volume of oxygen absorbed is much lowered during germination; so that there is oxidation. These facts, in the particular case of the beech, seem in correlation on one hand with the localization of the glucoside in the hypocotyledons, on the other hand with the existence of this substance limited to the germinative period. In sum, the shoot of the beech contains a glucoside and a diastase which, under the action of water, gives birth to methyl-salicylic ether and to a glucose assimilated by the plant. This reaction, localized by the hypocotyledons, is produced neither in the seed nor in the mature plant.

The formation of methyl-salicylic ether is, therefore, characteristic of the germinative period of the beech.

FAST TRIP AROUND THE WORLD.

CHARLES C. FITZMORRIS, a boy who was sent around the world on a time race by The Chicago American newspaper, arrived in Chicago July 20, having made the tour in 60 days, 13 hours, 29 minutes and 42.45 seconds. The distance covered by land and sea was 20,455 miles. His route was by way of the Siberian railroad as far as completed and the Amur River. His record was as follows:

	Miles.
By water—	
Ocean steamers	8,640
Channel boats	235
River steamers	1,100
Rowboat	300
Tugboat	75
Ferryboats	40
Total	10,390
By railroads or land	10,055
Total	20,455

The Russian Minister of Railroads estimates that when the Siberian road is completed the whole trip can be made in thirty-three days, little more than half the present time, providing only that the fastest trains are taken and there is no missing of connections. His estimate of the stages of the journey is:

	Days.
St. Petersburg to Vladivostok	10
Vladivostok to San Francisco	10
San Francisco to New York	4½
New York to Bremen	7
Bremen to St. Petersburg	1½
Total	33

—Railway Review.

FLESH-EATING AND DECAYED TEETH.

OUR reluctance to become vegetarians may ultimately make us toothless, so we are warned by the editor of Modern Medicine. He says: "It has long been recognized by dentists that the use of flesh food is a prolific cause of decay of the teeth. Caries of the teeth is due to destruction of the teeth by the growth of microbes. These microbes require for their development the proteid substances which are found in meat or other animal substances. When flesh is used for food, the small fibers which become fixed between the teeth constitute the best possible culture-ground for teeth-destroying microbes. It is for this reason that dentists are so careful to instruct their patients to clean their teeth by drawing threads between them. Dr. Egbert, who has made a careful study of the teeth of the natives of India, in an article in The British Journal of Dental Science, states that although he has examined the teeth of hundreds of Hindu natives, he has never found a single case of malformation, and that the teeth of the Hindu people are remarkably free from decay. They rarely lose their teeth from caries. He attributed this remarkable immunity from a disease which is coming to be almost universal among Americans and English people, in part to the cleanly habits of the Hindus, who carefully cleanse their teeth with a primitive but efficient brush every day, not only as a matter of hygiene, but in obedience to the laws of their religion. He also calls attention to another and still more important factor—the absence of flesh food from the dietary of the Hindu.

The rapid decay of teeth manifest among the people of the United States, which threatens to render us a toothless race within a century, is without doubt very largely due to the rapid growth of flesh eating in this country."

TRADE NOTES AND RECEIPTS.

Production of Powdered Sugar.—Vallez and Geraud, of Montpellier, have invented a new process of producing powdered sugar direct from sugar solutions. The sugar solution is heated in a vessel with free admission of air, and after acquiring a temperature of about 120 deg. C. is passed into a stirring vat with shafts turning 30 to 40 times per minute. The water will immediately commence to evaporate and the strongly agitated mass finally becomes pulverulent. After about a quarter of an hour the whole process is terminated, whereupon the trough is tipped and emptied, the motion continuing, by means of a special contrivance. The advantages of the new process consist in that the production of the powdered sugar is accomplished by a single operation and the former operations of granulating and grinding are rendered unnecessary, thus avoiding all loss of sugar.—Neueste Erfindungen und Erfahrungen.

New Product of M. Lepine Called "Cerusine," Designed as a Substitute for Painting with Oil.—This new product is composed of animal glue, to which white lead, chalk, gum, resin, etc., have been added. The inventor has furnished us with a sample of the composition, and he states that in a kilogramme of animal glue proceeding from the waste of leather and various other materials, about two or three kilogrammes of white lead may be mixed. For the purpose of rendering the mixture siccative, there are added a less or greater proportion of borax and a small quantity of potash or nitric acid. Or, for one hundred kilogrammes of the product, composed of glue and white lead, there may be added 5 kilogrammes of borax, 500 grammes of aluminium sulphate and 500 grammes of potash, or a small quantity of nitric acid. The mixture is prepared cold. To obtain colors tinctorial products are made use of.—Translated from La Revue des Produits Chimiques.

Treatment of Furniture in Natural Oak.—In order to obtain for old German oak furniture the so-called antique tone, it is generally more or less stained; if this is not done, it can lay no claim to the attribute Old German. The modern method is more and more forcing its way, and the oak wood is allowed to retain its natural shade. It is a well-known fact that the large pores always look rather smeary, according to whether the workshop is more or less dusty. If this is to be avoided, which is essential for half-way neat work, take good wheat starch, pound it fine with a hammer and stir by means of a wooden spatula good strong polish with the wheat starch to a paste and work the paste into the pores by passing it crosswise over the wood. After about one-half hour, rub down the wood thus treated in such a manner that the pores are filled. In case any open pores remain, repeat the process as before. After that, rub down, polish or deaden. If this operation is not performed, the pores will always look somewhat dirty, despite all care. Every cabinet maker will readily perceive that this filling of the pores will save both time and polish in the subsequent polishing.—C. Ammon, in the Fachblatt fuer Holzbearbeitung.

Bronze Substitutes.*—The bronze colors which are extensively employed for bronzing articles of plaster and wood, as well as metal castings, and also in the manufacture of colored paper and wall paper, are known to be produced from the waste of metal-beating, by finely grinding and heating with a little oil, tallow, wax or paraffin. To find a cheap substitute for them has been the endeavor of many for years. Of late, a French patent giving the composition of such imitation bronzes has become known, whose preparation is given below. These products consist chiefly of powdered aluminium and a resin solution, to which certain pigments are added in certain quantities.

The following recipe is used in making imitation gold bronzes:

Sandarac	50
Mastic	10
Venice turpentine	5
Alcohol	135

In the above dissolve:

Metanil yellow and gold orange	0.4
Aluminium, finely powdered	20 grammes

and shake. If a deeper shade is desired, it is well to use ethyl orange and gold orange in the same proportion instead of the said dyestuffs.

For the production of imitation copper bronze, take the above-mentioned resin mixture and dissolve therein only gold orange 0.8 and add aluminium 20 grammes, whereby a handsome copper color is produced. Metanil yellow 0.4 gramme without gold orange gives with the same amount of lacquer a greenish tone of bronze. Further experiments have shown that the pigments must not be made use of in larger quantities, because the luster of the bronze would be materially affected. Furthermore a series of tests have demonstrated that only pigments of certain properties, such as solubility in alcohol, relative constancy to reductive agents, are suitable; unsuitable are, for instance: Naphthol yellow, phenylene-diamin, etc. Likewise only a lacquer of certain composition is fit for use, other lacquers of commerce, such as zapon (celluloid) lacquer being unsuitable.

The bronzes prepared in this manner excel in great luster and color effect. The cost is very low. They are suitable particularly for bronzing low-priced articles, such as tinware, toys, etc. Under the action of sun and moisture the articles lose some of their luster, but objects kept indoors, such as figures of plaster of Paris, inkstands, wooden boxes, etc., retain their brilliancy for years.—From the German of Dr. L. P. in Neueste Erfindungen und Erfahrungen.

* The term "bronze" is said to be an abbreviation of "aes Brundisium," i. e. metal from Brundisium (now Brindisi.)