

the smoker is soothing and companionable. The amount of nicotine in the smoke is certainly not the determining factor in the pleasure; the aroma is more important. During the last fifteen years an enormous increase has taken place in the amount of tobacco smoked and especially in the form of cigarettes and it is difficult to avoid the view that its prolonged and excessive use must have a deleterious effect.

BLUEBERRY LEAF EXTRACT*

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In 1925 Professor Durig of the University of Vienna became impressed with the benefits of blueberry leaf as used in the form of a tea for diabetics among the Alpine peasantry, and directed that an investigation of its properties be made in his laboratory. As a result of these investigations it was shown that an infusion of the blueberry leaf had a distinct but variable influence on the alimentary hyperglycæmia of dogs. Later on Dr. Wagner, the chemist who carried out this investigation, was able to demonstrate the presence of two antagonistic ingredients in the leaves, one tending to raise and the other to lower the amount of sugar in the blood. The latter substance was first investigated and partially purified and was given the name of "myrtillin" from the myrtle family of plants, in a number of which it was found to be present. In further experiments this new principle was found to reduce alimentary glycosuria and prolong life in depancreatized dogs, and to reduce or abolish glycosuria in diabetic patients. Papers upon it have been presented at several of the American societies during the past year.

Myrtillin occurs in almost all green plants. Plants of the myrtle family, and especially the leaves of the blueberry, have an advantage in the relative abundance of the ingredient and its ease of separation. Myrtillin as obtained from blueberry leaves (*vaccinium myrtillus*, and *vaccinium pennsylvanicum*) by a comparatively simple process is a greyish or brownish amorphous substance which has not yet been obtained in a chemically pure state. In water or dilute alcohol, it forms a slightly turbid colloid solution. Acids favour its solution.

* Abstract of paper read before section on Pathology and Physiology, 78th annual session, American Medical Association. *J. Am. M. Ass.*, Nov. 5, 1927, p. 1577.

Klin. Wochenschrift, Aug. 27, 1925, iv, 1692-3. *Ibid.*, iv, 1870-1; also papers read before the Federation of the American Society for Experimental Biology—and an outline of observations presented to the Association of American Physicians.

Alkalies cause its gelatinous precipitation. It is insoluble in pure alcohol, and has a rather high resistance to heat. It would appear to be a plausible assumption that these two ingredients found in the leaves of so many species of plants represent opposed factors in the carbohydrate metabolism of plants; myrtillin being the anabolic factor, and the other principle, referred to above as the sugar raising principle, the catabolic factor. Myrtillin is entirely different both chemically and physiologically from insulin. Even the largest doses are apparently non-toxic. It may possibly rank among the vitamins, and appears to be equally effective when administered intravenously or orally. It does not appreciably change the normal fasting blood-sugar content, and never causes hypoglycæmia. Its characteristic effect is a reduction or complete suppression of the hyperglycæmia following the administration of large quantities of dextrose to dogs or human beings. The effect is not a mere alteration of the absorption capacity for it is obtained when the myrtillin is given orally and the dextrose intravenously or vice versa. Myrtillin appears to be able to be stored in the body, for its effects can be demonstrated in gradually decreasing degrees for some time after a single dose only has been administered.

Totally depancreatized dogs seldom survive more than a few days. The extreme cachexia and diabetes produced by this operation are well known. If severe symptoms fail to appear and the animal survives several weeks, there is always reason to believe that the operation was incomplete or that accessory pancreatic tissue was present. Myrtillin however administered soon after the operation, not only lengthens the duration of life, but instead of rapid cachexia setting in the animal continues to appear strong and lively for several weeks, glycogen remains abundant in the liver, and the body weight after an initial fall is well maintained until a few days before death. Sugar then appears rapidly in the blood and urine, and wasting takes place immediately. Insulin will still save the animal if administered in time.

When such a small remnant of the pancreas as one-fiftieth of the organ is allowed to remain, myrtillin appears even still more successful, and dogs have been kept under its administration in good condition for an indefinite period without any artificial aids to digestion, with urine free from sugar, and the blood sugar content never above normal. Without the employment of myrtillin such an operation would have proved just as surely fatal as if the total organ had been removed. The administration of myrtillin effects apparently an actual cure. Experiments to date would indicate that myrtillin also tends to stabilize the blood sugar which

otherwise is apt to fluctuate widely, and that it spares insulin. In the cured cases the pancreas remnant has been found greatly hypertrophied up to ten times its original size, but as hypertrophy has sometimes been obtained without the use of myrtillin it cannot yet be stated with certainty that such regeneration is entirely due to the myrtillin.

Dr. Allen in his paper reports on 81 cases of diabetes in the human treated with myrtillin. In these patients the effects did not seem to be as prompt nor as powerful as in dogs. A week or possibly longer may be required before the full action of the myrtillin is manifest. The gradual beginning and the gradual wearing off of the effects of myrtillin tend to make accurate studies difficult. Allen found it inadvisable to give myrtillin to patients with unchecked glycosuria. The slow and mild action of the myrtillin in these active cases often proved ineffectual. It is better to use diet restriction, and if necessary insulin to stop the glycosuria and bring the blood sugar to normal, and then begin with myrtillin and look for results in a gradual rise of tolerance and a gradual diminution or disappearance of the need for insulin. The empiric dose of myrtillin is one gramme a day. If the dose be much smaller than this amount, the noticeable effects are slight. On the other hand little increased action is secured from larger doses, but even the largest doses are non-toxic.

Myrtillin never causes hypoglycæmia. Its stabilizing influence appeared in many of the patients, and its employment would appear to be especially valuable in patients subject to troublesome hypoglycæmic attacks. In several children myrtillin reduced such attacks in number and severity or prevented them completely.

In some cases for reasons not yet discovered myrtillin appears to fail in the above effects. It is uncertain what period of trial is proper before accepting failure. In one child with particularly severe diabetes the usual two months' period did not bring a reduction of insulin, but its continuance was requested because of the nearly complete freedom from previous hypoglycæmic attacks. After a year, it had become possible to reduce the insulin from 50 to 30 units. In general, the best results are obtained in the milder cases and in middle aged or elderly patients. Children react poorly. There is, however, no infallible clinical rule. The benefit of myrtillin when obtained is indefinite in duration. When myrtillin is omitted accidentally or intentionally for a few doses or even a few days no important change is noted. The continuance of the effect for from one to several weeks can only be explained by some storage in the body.

In closing a discussion which followed the

reading of this paper Dr. Allen said, to propose a new remedy for diabetes is one of the riskiest things a person can do. The results obtained in animals seem to be beyond question and other laboratories have confirmed my findings.

In an Editorial Comment the *Journal of the American Medical Association* refers to the fact that the Council on Pharmacy and Chemistry advise caution. On the basis of the evidence laid before it the Council points out that while the drug has possible usefulness, the actual value of it in the treatment of diabetes in man has not yet been proved, and that such proof must come from workers, who have the necessary clinical opportunities, and laboratory facilities on which to base judgment. Nevertheless the above report of the action of this drug coming from an investigator, who has contributed so much to our knowledge of diabetes deserves careful consideration and investigation. (Ed.)

THE STORY OF CIRCUMCISION*

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It is probable that circumcision has been thought of by the majority of people, as it was by myself, to have been a religious rite peculiar only to the Hebrews. This is not so, but the great antiquity of the practice has obscured its real origin and object.

Strictly speaking, the term "circumcision" is applied to a nationally wide-spread operation for the ablation of the male prepuce, though a looser application of the term has been made to include simple incision of the prepuce, and two operations upon the female genitals—clitoridectomy and ablation of the labia minora. Female circumcision has been comparatively rarely performed and will not be described.

The operation upon males is a very common one, not only among primitive, but also among highly civilized peoples. Its use, however, as a therapeutic measure is a very modern one, and is not a satisfactory explanation of its ultimate origin.

A great deal has been written as to the antiquity of the practice, but in it all there is very little conclusive evidence and much speculation. It is a curious fact that few peoples practising this rite have any legend or theory as to its origin; they do it because their fathers before them did it. The sources of information are so meagre that it is not to be wondered at that many divergent opinions are held as to its origin. The Old Testament, Egyptian monuments, and the writings of early historians, undoubtedly influenced by the traditions and superstitions of the people among whom they

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