CHAPTER XI.

THE ORAL FLUIDS.

THE principal fluid found in the oral cavity is the saliva. Other fluids are those coming into it from without, those regurgitated into it from below, and the secretions from mucous and associated glands. The oral fluids have to do with dental caries.

What is known as saliva is a commingled fluid secreted by three sets of glandular bodies,—namely, the parotid, the submaxillary, and the sublingual glands,—while another association of the fluid, as it is met with in the mouth, consists of a substance known as mucus, which is furnished, in varying quantity, by follicular glands lodged in the oral and pharyngeal mucous membrane. To see this latter, wipe the roof of the mouth, when it shows itself as dewdrop-like particles standing over the surface. Other admixtures of the fluid consists of particles of articles of food, cast-off epithelial scales, animal and vegetable parasites; these latter commonly in great variety.

The type of a salivary gland is seen in a bunch of grapes; the tube of outlet corresponds with the branch, the individual canals with the stem of the fruit, the secreting cells with the fruit itself. The development of a gland begins with the canal, this sending off bud-like processes which find accommodation in a cellular blastema; cells, canals, and blastema comprise the bulk of an organ.

Analysis of true saliva is more or less an unsatisfactory proceeding, owing to the difficulty of securing unmixed specimens. In 1000 parts ordinary analysis yields in the neighborhood of 990 of water and 10 of solid matter. A formula made by Dr. Wright gives the solid matter at 11.90, as follows: ptyaline, 1.80; mucus (and epithelium), 2.60; fatty matter, .50; albumen (with soda), 1.70; sulpho-cyanide of potassium, .90; alkaline and earthy salts, 3.20; loss, 1.20. Variation of from 7 to 12 is suggested by Carpenter as allowable within the health range. The quantity secreted daily by the healthy average man he approximates at 18 ounces.

Saliva is normal or abnormal; the first state relates with health, the second with pathological conditions; to appreciate the latter requires understanding of the former.

Parotid Secretion.—The secretion of this gland has a specific gravity of about 1.006; it is without viscosity, according to late writers, and contains in solution carbonate of lime, together with traces of chloride of potash, bicarbonate of soda, and sulpho-cyanide of potassium. Magitot gives 95 to

98 parts of water to the 100 against 2 to 5 parts of the solid substances named.

The parotids secrete alternately, and from the fact of their excessive development in ruminant animals are to be esteemed the lubricants of the oral cave. Meal or dry bread put into the mouth excite these glands to vigorous action. This fluid seems to be variously acid, alkaline, or neutral as times and circumstances relate with it; it may be inferred to be the second of these when the carbonate of lime deposits against the molar teeth in form of tartar. Innervation lies with the 5th and 7th nerves, explanation existing in this of the profuse salivation found so commonly associated with oral operations. Influence of mind on glandular secretion finds a striking example in the parotid, violent emotion suspending elimination; the Indian method of discovering a criminal by means of rice held in the mouth is familiar.

SUBMAXILLARY SECRETION.—The secretion of this gland is markedly in relation with the process of insalivation, as witnessed by the excitation of its action when sapid substances are tasted and its almost total suppression during periods of fasting. Experiments made by Claude Bernard show the excito-motor to lie with the gustatory and chorda tympani nerves. The fluid of this gland while very clear is yet very tenacious. Excess of ptyaline affords a coagulable appearance under the influence of cold. Animals making use of the viscid principle, as example is furnished in the ant-eater, have submaxillary glands of large proportion. The secretion, according to analyses made by Bidder, contains 3, in 100 parts, of organic, and about 5, in 100 parts, of inorganic matter. No sulpho-cyanide of potash is found.

Sublingual Secretion.—This differs but in degree from the secretion of the submaxillary gland. A viscidity characterizing it is owing to the presence of ptyaline, which is proportionably greater than in the other.

Accessory Parotid.—This is an associate gland related with the duct of Steno; its secretion is thought generally to correspond with that of the immediately preceding, and with that of the submaxillary.

Claude Bernard performed the following experiment, which affords clinical demonstration of the difference alluded to as existing in the composition of the secretion from the different glands. First he effected an entrance through external incision into the œsophagus of a horse, extracting the food bolus as it descended from the mouth; weighing this, he found that it had increased in weight elevenfold as a result of the saliva it had absorbed. A succeeding step was to tie Wharton's duct, with the result of finding that it required forty-one minutes to masticate what before had taken but nine; while the mass, when withdrawn from the œsophagus, was coated with a glutinous mucoid fluid, the interior being dry and friable; the increase of weight was only about three and a half.

Healthy saliva is a slightly opalescent fluid, somewhat glairy, commonly alkaline; the meaning of it in the animal economy is both excrementitial

and recrementitial. Whether, however, the latter office pertains alone to deglutition, or to this and to digestion as reference is had to starchy matter, does not yet seem definitely to be settled. Perhaps physiology will eventually decide that the parotid secretion pertains to the first office, the syrupy product of the submaxillary and the ptyaline of the sublingual to the second. Carpenter expresses the conviction that the most important action of saliva relates to preparing food for chemical influences to which it is later to be subjected.

The organic matter found in the parotid secretion is coagulable by heat, by nitric acid, and by the sulphate of magnesia. In the case of the submaxillary it is not so coagulable. The secretion of the sublingual is so viscous that it is with difficulty its density can be ascertained by the areometer; it is not clouded by exposure to air, contrary to that of the other salivas. Healthy saliva is characterized by the presence of a limited number of corpuscles. (See foot-note in chapter on *Dental Caries.*)

*Abnormal Saliva.**—Attention is required to be given the oral secretions during the continuance of general acute affections. Under the influence of pathologic conditions of this kind, pyrexiæ, eruptive fevers, inflammatory

* In Magitot's instructive and interesting work treating of dental caries reference is made to laboratory experiments on human teeth with the sugars, lactic acid, butyric acid, malic acid, cider, carbonic acid, albumen and albuminoids, alum, oxalic acid, and the acid oxalates, acetic acid, tartaric acid, and acid tartrates, chloride of sodium and tannin. The experimenter directs attention to the fact that the teeth selected were from adults, and that they were perfectly sound, with the exception of a few taken intentionally showing a beginning more or less advanced of caries. In one group the teeth were absolutely free in the liquids; in the second they were completely coated with sealing-wax, having a single perforation over the enamel with a view of strictly localizing action of the liquid. These experiments are easily to be repeated by anybody; little, however, is gained from them as judgment is to be made up concerning vital teeth.

Experiment 1.—Solution in water of cane sugar, 1 to 3. Teeth placed and allowed to remain two years. Result: Teeth softened, blackened, enamel chalky, friable, and detached at several points, roots gelatinous. Certain of the teeth protected, except at single point, with coating of wax, showed at exposure alterations identical with the preceding.

2. Same solution, with addition of a fragment of animal matter for the purpose of making fermentation more active. Result: Teeth so changed as to be unrecognizable.

3. Same solution, with addition of a few drops of creasote, with view of retarding fermentation. Result: Teeth showed roots softened and brown without intense blackness of former experiment.

4. A one-third solution of glucose placed in same condition, with addition of creasote. After two years, liquid had not changed in appearance. No alteration showed in the exposed teeth.

5. Cold saturated aqueous solution of sugar and milk. After two years, fluid remained clear; no mouldiness or deposit; reaction perfectly neutral; no alteration in teeth.

6. One-third solution in distilled water of cane sugar filtered, and raised to the boiling-point, was placed in a flask and hermetically sealed in the flame, and left to itself for two years. A group of sound human teeth, weighed with the greatest care, had been previously introduced into the boiling liquid, and when weighed, after being washed and dried, proved to have undergone no loss nor any appreciable change.

7. A solution of glucose under identical conditions gave the same negative results as to action on teeth.

Lactic Acid.—1 gramme of acid to 1 litre of water (1 part to 1000). No change in teeth after two years of exposure.

2. Lactic acid 1 part, water 100 parts. Teeth exposed to this solution became gelatinous and reduced in volume; enamel chalky, friable, and changed to a brown color.

Butyric Acid.—Solution, 1 part to 1000 of water. Enamel of exposed teeth green, white, chalky, opaque, and brittle. Roots were made penetrable by an excavator.

2. Solution of 1 part to 100. Enamel removable without the least effort. General color yellowish. Roots softened throughout their extent and made flexible or gelatinous.

Citric Acid.—Solution, 1 part to 1000 (1 gramme to 1 litre of water). Teeth exposed two years; were found enveloped in mammillated, whitish growths, composed of citrate of lime; deprived of enamel; roots softened; no special coloration.

2. Solution, 1 part to 100. Teeth left exposed found completely deprived of enamel, the whole being converted into citrate of lime and deposited in bottom of glass. The teeth, thus reduced to their ivory and cement, had undergone no other apparent change, neither loss of substance; taken between the fingers they were found flexible, spongy, and gelatinous.

Malic Acid.—Solution, 1 part to 1000. Teeth exposed presented a complete opacity of the whole enamel layer, which was friable and chalky, but not removed from its position, nor detached from the surface of the dentine.

2. Solution, 1 part to 100. Teeth presented same alteration in character with the preceding, but with an intensity proportioned to strength of liquid.

Cider.—Common Normandy cider used, acid malic. Injurious effect on teeth deduced from preceding experiments.

Carbonic Acid.—Seltzer water used. 1 volume water to 5 of gas. Result: At the end of a week thin plates of ivory were found softened and flexible. Sound human teeth had undergone marked alteration in their substance, and a loss of weight to the amount of about a tenth; dentine of root could be pierced with a sharp instrument; enamel had become friable and chalky.

2. A second experiment submitted preparations to a solution of carbonic acid exposed to the air,—that is, to equal volumes of gas and water. Result: Nil.

Albumen and Albuminoids.—Solution composed of one litre of water to the white of two eggs well shaken in the liquid. Experiment lasted two years. Result: Teeth left freely exposed found to have undergone general and uniform softening; roots translucent; enamel friable and opaque. One tooth, protected with wax, except at a very resisting point of enamel, was found to show but slight alteration, this resembling the beginning of caries. Another tooth, exposed upon free edge deprived of enamel, showed softening of more pronounced character, which had resulted in formation of a cavity in the form of a deep cleft, with every characteristic of caries.

Alum.—Solution, 10 grammes of alum in a litre of water. Experiment continued two years. Reaction clearly acid. Teeth left free in the solution not at all affected as to their roots. Enamel deprived of its glossy look, having become opaque; its disorganization was so complete as to offer the appearance and brittleness of chalk.

Bi-oxalate of Potassa.—Solution of 1 part to 1000 of water. Result: Nil.

2. Solution, 1 part to 100. Result: Enamel of teeth found opaque, friable, and easily reducible to powder. No change in cementum nor in dentine.

Acetic Acid.—Solution of crystallizable acetic acid, 1 gramme to 1 litre of water (1 part to 1000). Experiment two years. Result: Nil.

2. Solution identical with above, creasote being added. Result: Nil.

3. Solution of 1 part to 100 (water 200 grammes, acetic acid 2 grammes). Experiment two years. Result: Teeth freely exposed exhibited, as the roots were involved, the alterations of softness, flexibility, yellow color; the roots being thinned lengthwise until of little greater circumference than common pins. Enamel undisturbed offered the curious appearance of crowns supported by pivots or pegs.

diseases, phlegmasiæ of glandular tissue, marsh fever, etc., Magitot most practically and appreciatingly calls attention to the fact that there are produced by reflex action upon the mouth, immediate phenomena which are the suppression, more or less complete, of the salivary liquids, while at the same time the mucus is increased yet not less deteriorated. Glairy alkaline muco-saliva is a common associate of amygdalitis, acute or chronic, and is not infrequently met with in general pharyngitis. A condition of this kind is assuredly adverse to the health of the dental organism, as the tenacious fluid not only bathes continuously the necks of the teeth, but invites and retains the débris of ingesta; to keep such a mouth cleansed is next to an impossibility. Sordes, a good name to apply to the incrustations about the teeth, is, undeniably, a softener of enamel; removal of the incrustations, where of long existence, showing the parts of a dirty yellow, and altered as extent of cohesive force is concerned. Magitot attributes the dental change to the acid formed in the fermentation.

Excess of ptyaline, combined as it always is with perversion in follicular activity, furnishes the agent for cheesy deposits; at the same time that

Tartaric Acid.—Solution, 1 part to 1000 (tartaric acid 1 gramme, water 1 litre). Result: Nil.

2. Solution, 1 part to 100 (tartaric acid 2 grammes, water 200 grammes). Result: The teeth freely exposed showed no change on their crowns; the enamel was simply covered with a layer of crystals, but remained absolutely intact. The roots, without being generally softened, had yet undergone a real alteration in their substance; dentine had retained its color and translucency.

3. Cream of tartar 1 gramme, water 200 grammes. Result: Nil. Magitot suggests that the peculiar action of the tartrates is to be regarded as a solution of the phosphates. As for the acid tartrates contained in wine, and especially in many kinds of fruits, it is to be esteemed as analogous to that of tartaric acid.

Chloride of Sodium.—Solution, 1 part in 100 of water, with the addition of three drops of creasote. Experiment covering two years. Result: Teeth freely exposed underwent no alteration of their substance, except that they took on a darker color generally, which was intense at the roots.

Tannin.—Solution, 1 part in 1000 (tannin of commerce 1 gramme, water 1 litre). Result: Nil.

2. Solution, 1 part in 100 (tannin 2 grammes, water 200 grammes). Result: No effect on enamel; kept its polish, but was covered with a light deposit of a greenish coloring matter. Cementum showed marked softening; was easily penetrated by excavator; assumed a light brown color.

In a résumé, M. Magitot classifies as follows:

1. Agents which act uniformly upon all the dental tissues; such are: the sugars by their products of fermentation; the lactic, butyric, citric, and malic acids; cider, carbonic acid, the products of putrefaction of albumen and albuminoid substances.

2. Those which disorganize the enamel specially and exclusively, with formation of salts of lime, soluble especially in the acid liquors: alum, oxalic acid, and the acid oxalates.

3. Those which act specially and exclusively on the dentine and cementum, with formation of salts of lime, soluble especially in the acid liquors: acetic acid, tartaric acid, and the acid tartrates, tannin.

4. The substances wholly without action on the teeth, as chloride of sodium, and generally all other substances which may be met with in the buccal cavity soluble in water and the saliva with neutral or alkaline reaction.

which has affected the integrity of the secreting bodies has involved as well the health of the teeth. Caries, here, is simply a result of what may be called stasis in resistive force; if there were more acid, there would be more health; a condition well expressed in typhoid fever, where progressive deterioration in every direction finds its only check in the free use of agents which offset the super-alkalinity out of which the disease arises. (See Condition 4, chapter on *Caries.*)

Salivary secretions, unhealthy in themselves by reason of a constitutional expression, are characterized by offensiveness of odor; to smear such saliva over a cold body, a common writing-slate being particularly adapted to the purpose, is to possess one's self quickly of perception of an offence residing in the organic constituents. Such saliva is not wisely swallowed into the stomach without being disinfected.

Saliva deteriorated by admixture with local sources of offence, as with the pus of abscess and ulcers, the detritus of decaying teeth, the chippings of tartar, the sordes of mercurial, typhoid, or scorbutic deposits, is to find correction by treatment directed to the offending cause.

Saliva unduly alkaline is accompanied by excess in secretion; unduly acid, it is expressive of dyspeptic complications. Excess in salivary secretion is almost certain to be related with moist and decaying teeth; limited secretion prognoses long life to the dental organism. A weak acid state of the oral fluids is infinitely preferable to a condition strongly alkaline,—the dental association being alone considered.

Saliva unduly acid acts destructively on the lime-salts, of which the inorganic portion of a tooth is composed. Remedy lies in correction of the condition from the constitutional stand-point and in the prescribing of antacid washes. Acids sometimes found in the mouth, in association with saliva, are the acetic, carbonic, hydrochloric, nitric, sulphuric, malic, oxalic, lactic, citric, tartaric.

Unduly alkaline saliva being expressive of sub-acidity of the blood, counter-medicaments are indicated. In this connection the author knows of no better treatment than is found in dilute hydrochloric acid prescribed in conjunction with sulphate of quinia and strychnia:

℞.—Quiniæ sulphatis, ℥i;
Strychniæ sulphatis, gr. ss.

M. and make into pills No. 30, using for the purpose extract of gentian. Of these pills one is to be taken three times a day.

The acid is to be prescribed in fifteen-drop doses, repeated three times a day; the time of taking being intermediate to that of the first medicine. The fungi in such mouths find destruction by evolving sulphurous acid after a manner suggested a few pages back; or, a bearable dilution of chloride of zinc may be used as a wash: this last will destroy cryptogamia almost immediately. By treatment as just suggested the author has been instrumental in saving many a denture.

The test for alkalinity consists of nothing more than the use of slips of turmeric paper employed at varying periods in the twenty-four hours: alkaline fluids turn this paper yellow. The conditions of alkaline oral fluids seem to depend on an excess of the phosphates of lime and soda. An ammoniacal smell in the saliva is indicative of danger to the system at large. In an alkaline diathesis the demand is for an excess of animal over vegetable food; this indication is not to be neglected.

Acid conditions of the oral secretions find a simple test in the use of litmus paper; this paper, which is blue, being turned red by contact with an acid. To secure therapeutical analysis of acid saliva, nothing more is required than that a given specimen be measured by its effect on lime-salts. To an indefinite quantity of the secretion is added a measured and weighed proportion of the salt; either phosphate, carbonate, or fluoride of lime being used. The saliva being evaporated after a given time, a sufficiently just estimate is to be made of its influence on the teeth; the resistance residing in vitality being taken into the account.

Analyses of acids are made according to the ordinary provings of chemistry, which see. Sulphuric acid is to be presumed present where carious holes in teeth show a black surface. To directly test for this acid a solution of barium chloride is added to the saliva; if the acid be present a white precipitate deposits. This precipitate is not to be mistaken by reason of being insoluble either in acids or alkalies.

Nitric acid is peculiarly objectionable to tooth structure; its presence in saliva is to be exposed by boiling with the suspected fluid some copper filings; red fumes being given off if the acid is present, and the liquid acquiring a blue color. Another test is to dip a piece of litmus paper in a weak solution of potash; after this in the saliva; if nitric acid be present the paper burns with deflagration. This last, however, is not so reliable a test as the former.

Hydrochloric acid, objectionable in the mouth only when in excess, finds a simply applied test in nitrate of silver. To an indifferent quantity of the saliva a solution of the nitrate, sixty grains to the ounce of water, is added; if the acid be present its presence is shown by a white precipitate. This precipitate, which is a chloride of silver, is insoluble in nitric acid, but very soluble in caustic ammonia; it soon turns dark if left exposed to the atmosphere.

Lactic acid is an associate of gout, rheumatism, malarial fever, diabetes, and of general gastro-enteric derangements. A person with decaying teeth laboring under any one of these conditions is to have the oral fluids tested for the objectionable agent. The treatment is, of course, to be directed to the systemic vice.

Accidental substances found in the saliva are uric acid, urea, urates, bile, milk, cholesterine, and albumen. The presence of these is never disassociated from disturbance in the related organs or systems: treatment is to find direction accordingly. (See works on Practice of Medicine.)

In prescribing for salivary conditions it is necessary that a practitioner distinguish between local and systemic productions: thus, for example, it is not difficult to understand that in a strongly alkaline mouth, with much soft caries present in the teeth, each cavity shall show an active corroding agent in the presence of sulphuric acid; this acid being evolved through the action of some existing agent on the albuminoid expression in which such soft teeth are rich.

Carbonic acid serves as another illustration. This acid may be found existing in the fluids of the mouth to an extent markedly injurious to the teeth. Eight ounces troy is the medium quantity of carbon expired by a healthy man in the course of twenty-four hours. Indefinite is the amount that may be converted by the oral moisture into a corroding acid by the amount of oxygen therein intimately related with it. People inhabiting warm climates have better teeth than the residents of cold regions. The proportion of carbonic acid expired by the first is quite one-half less than of the other. Teeth decay in many instances very much faster in winter than in summer weather. Between 86° and 106° the carbonic acid set free in man is one-half less than when the thermometer marks the freezing-point.

Age, sex, development of body, state of health or disease influence carbonic exhalations. These relations are to be considered in connection with dental caries manifesting itself under the different conditions.

The acid of fruits acts injuriously on very soft teeth alone; where acids are freely used in this form frequent rinsings of the mouth with pure or medicated water will not be amiss.

CHAPTER XII.

THE TEETH AND THEIR DISEASES.

ODONTALGIA.

UNDER this common head are to be studied the various pains in the teeth, however induced. The term comes from the two Greek roots, *odons*, a tooth, and *algos*, pain,—odontalgia, toothache, or pain in a tooth.

The causes of toothache are to be classed under the following heads:

1. Sensitive dentine.
2. Direct or indirect exposure of the pulp to sources of irritation.
3. A diseased state of the periodonteum.
4. Confinement of pus and gas in a pulp-cavity.
5. Granules of osteo-dentine in a pulp.
6. Sympathy.
7. Recession and absorption of the gum and alveolus.

1. *Sensitive Dentine.*—Some teeth, immediately on the breaking down of the enamel and the consequent exposure of the dentine, become exceedingly sensitive; in other words, exhibit themselves as peculiarly susceptible to the influences of irritating agents. This impressibility is attempted to be explained by the most dissimilar hypotheses, few subjects connected with the teeth having elicited more discussion and controversy.*

* An observation of the pulps of certain teeth which have been exposed to irritation in cavities unopened as well as open will exhibit the existence of fungoid excrescences. Only very lately it has happened the author to open several teeth which had been partly destroyed by caries, the pulp-chamber, however, being intact; in two of these cases a magnifying-glass of very ordinary power exhibited thread-like excrescences of most minute and fibrilla-like appearance, passing in clusters from the surface of that portion of the body of the pulp adjoining the cavity of decay. These excrescences were in each instance of a pearly-white color, and might well have been likened to bundles of the delicate cobweb. It is suggested to the attention of the microscopist that it is possible that such excrescences passing into the tubular structure have been mistaken for nerve-fibrillæ. Without qualification, however, the author believes that exception may be taken to the doctrine that nerves pass from the pulp into the tubuli. It scarcely seems to need the microscope to demonstrate the correctness of such an opinion. That fibrillæ, however, may be found in teeth of loose structure, being intertubular, may readily be received as a fact, but their origin is to be sought in the enamel membrane and not in the pulp. One explanation at least of sensitive dentine would seem to be found in the relation of the dentinal circulation to the pulp through the medium of the halitus of the chamber; this finds (at times) demonstration in the marked relief so commonly gained through absorp-

In teeth thus sensitive, the operation of excavation is occasionally found so painful as to be quite unbearable, and is only to be accomplished through the employment of means that lessens such sensibility. Even sweets taken into the mouth, or cold or hot drinks, or acids, the latter particularly, will occasionally provoke pain in such teeth. Instances quite numerous exist where such dentinal sensibility is continuous, the pain being of a dull annoying character existing quite independent of foreign agents of offence. In these latter cases the exciting cause must be looked for in some irritative condition existing in the oral fluids: these may be too acid or too alkaline. Tests, however, are here easily made with the aid of litmus or turmeric paper. Specific remedies, accordingly, may have immediate employment.

As direct applications to teeth sensitive from the nature of their organization, medicinal obtunders in great variety are suggested. Of these perhaps the most permanently effective is arsenic: this application, however, possesses an objection in ill results almost certain to accrue to the dental pulp which renders the use of it entirely inadmissible; it is, nevertheless, very frequently employed.

Chloride of zinc is a favorite preparation, and where used immediately preparatory to excavating will be found commonly to answer most satisfactorily. In the employment of this agent, as in that of arsenic, care is to be exercised that such impression be not produced as shall unduly irritate the pulp. The application of the chloride of zinc is variously made. A common mode is to take a deliquesced preparation, dropping it, when it may conveniently be done, from the point of an instrument into the cavity, which cavity has been previously dried; the parts being protected from any inroad of moisture by means of napkin or dam. Another mode consists in employing a pellet of cotton saturated with the zinc. Still another manner, and the one to be preferred, consists in using the crystals direct, a few of these being placed in a cavity and allowed to liquefy. This last plan is to be commended above the others.

The almost immediate result of an application of zinc to a sensitive cavity is the production of quick, sharp pain; this, however, commonly disappears in from one to two minutes, when, the sensibility being found obtunded by the action of the agent upon the superficies of the cavity, excavation may painlessly proceed to that extent of depth to which the salt has acted. Reapplications are to be made as found necessary, although it is to be recognized that the fewer one can get along with the better for the subsequent health of the tooth.

Chloride of zinc in full strength obtunds immediately the part to which it is applied; diluted, it simply irritates and worries, increasing the very sensi-

tion from the cavity of all moisture, and the preservation of such dryness during the process of cutting. That entire dryness in a dental carious cavity is among the best antidotes to sensibility has come to have such common practical recognition that a large class of the most experienced operators rely exclusively upon it.