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**Original Communications.**

THE TREATMENT OF INFLAMMATIONS OF THE CONJUNCTIVA BY MEANS OF MEDICATED SPRAY.

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The use of the various atomizers and spray producers has long been a favorite method for the application of medicated fluids to the mucous membranes lining the nasal cavities, the pharynx, and the larynx. The advantage of the spray is, that by it the medicated fluid is applied evenly and equally to all parts of the diseased membrane—to crypts and crannies, to elevations and depressions, alike. At the same time, the current of cold air that accompanies it is usually agreeable rather than otherwise.

The transference of this method of treatment to the conjunctiva was first suggested and carried out by Dr. C. R. Agnew, in March of this year. We began the use of the spray in a case which I shall relate.

Miss Bridget F., æt. 26, native of Ireland, a waitress, came under our observation in July, 1878. She had granular conjunctivitis and pannus of the right eye, of four years standing. Early in 1875, the operation of canthoplasty was performed upon the eye by a distinguished New York ophthalmologist. She had, since that time, been under the care of several expert physicians, one after the other, each of whom had tried all his arts to cure her eye, but never with any more than temporary benefit.

When we first saw her the cornea was vascular, the palpebral conjunctiva thickened and rough, and the eye irritable, watery, and sensitive to light. The patient found it impossible to open the eye more than half as widely as the other, partly from photophobia, and partly from the inflamed condition of the lids. The vision of the eye was  $\frac{2}{300}$ .

We commenced treatment by applying, to the palpebral conjunctiva, a ten-

grain solution of nitrate of silver, using, instead of a camel's-hair brush, a slender bit of wood, with a little jeweller's cotton twisted about the end of it, and washing off the superfluous nitrate of silver with salt and water, a dram to the pint. The latter was done with a small bag syringe. The application was made sometimes daily, sometimes at longer intervals, according to the best indications; but still the eye remained about the same, and, after several weeks' treatment, it was decided to give the patient the benefit of another canthoplasty. Ether was administered, and the canthoplastic operation performed, after the most approved method.

After the patient recovered from the slight reaction, which often follows this operation, the eye was less lachrymose and irritable, and we hoped that a few weeks of careful treatment would be all that was needed. But we were disappointed. The eye was soon in as uncomfortable a condition as before. Sulphate of copper, alum, a solution of tannin in glycerine—each was tried in its turn, and each seemed to do good for a time; but the disease always relapsed, and, while using the remedy faithfully, the eye would become as bad as ever. Sometimes a solution of sulphate of atropia seemed to relieve the symptoms, and at other times it seemed only to increase the photophobia. Iced applications, hot applications, and bathing with lukewarm salt and water, a teaspoonful to the pint, were tried also, with some temporary benefit. The patient took several Turkish baths, and tonics were administered internally, but the disease obstinately resisted all their curative effects.

It was at this stage that Dr. Agnew suggested the trial of a medicated fluid applied in the form of a spray. A solution of tannic acid, gr. x.; glycerine, ʒiiss., and water, ʒi, was, by means of a Delano's Atomizer, sprayed first upon the vascular cornea and contiguous surface of the eyeball, and then upon the everted lids. The next day the patient reported relief, and the spray was repeated. The application has been repeated, sometimes daily, and sometimes every two or three days, up to the time of this writing. The patient's eye is now in a more comfortable condition than it has been at any time since she has been under our care. After the use of the atomizer for two weeks the vision had increased from little more than perception of light up to  $\frac{5}{200}$ , the cornea had lost much of its vascularity, the roughness of the palpebral conjunctiva was much less prominent, the photophobia diminished, and the patient going about with the eye more widely opened than it had been for years.

The success of the method was so marked in this case that we soon began to use it in others, and in all with satisfactory results. I am using it at the Manhattan Eye and Ear Hospital in all our cases of conjunctivitis, and with good results. Some old cases of granular lids and pannus, who have been treated for years, and have gone the rounds of the different charitable eye institutions, and have had all the methods of treatment in vogue tried upon them, and all with more or less temporary benefit, say that they are sure their eyes feel better after the use of the spray than after the usual applications of nitrate of silver, or of sulphate of copper.

The one disadvantage connected with the use of this method is, that it requires two persons to do it well—one to evert the lids and hold them in the proper position, and the other to do the spraying. Where there is pannus, about two ejections for the cornea, and four or five for the granulated lids, will commonly be enough daily. Where there is no pannus, and it is better not to spray the cornea, if the assistant will evert the upper lid, and hold it so with the thumb of his left hand, while he pulls down the lower lid with the thumb of his right hand, and if the patient will then make an effort to close the eye, the everted lids will lie in contact with one another, and protect the cornea,

while the whole of the palpebral conjunctiva of both lids will be exposed to the action of the atomized fluid. As the pannus diminishes, and the vision increases, it will be found more difficult to spray the cornea, the patient involuntarily turning it up out of sight.

I have, in some cases, made the application with only the assistance of the patient, holding the lids in position with my left hand, while directing the spraying tube with my right, and causing the patient to compress the air bag the necessary number of times.

Of course, other medicated fluids may be used besides a solution of tannic acid in glycerine and water. An excellent application is a solution of borax, gr. x., in aquæ camphor, ℥i. Nitrate of silver solutions may also be used in this way, and would probably be better than any other remedy in cases of purulent conjunctivitis. In applying this remedy by means of the spray, the face should be protected by a cloth, or a piece of paper, with an aperture through it just large enough to expose the everted eyelids, and thus avoid blackening the surrounding parts.

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## ON GENERAL AND LOCAL ACIDITY.

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BY JOHN C. PETERS, M.D.

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Numerous acids exist normally, or are produced in excess in the human frame.

Among the fatty acids, Glycero-phosphoric acid is found in the yolk of the ovum, in the cerebral substance, and in the bile.

*Formic acid* occurs in the fluids with which the muscles, brain and spleen are saturated; also in the sweat in considerable quantities; and in the blood of dogs after a prolonged sugar diet. It is also found pathologically in the blood, in rheumatism, suppression of perspiration, &c.

*Acetic acid* is a constituent of the juices of the muscles and spleen, and has been observed in the perspiration. It is known as one of the ingredients of the gastric juice, and probably occurs in the fluids of the brain. It appears as an occasional constituent of the blood after partaking of spirits in excess.

Secretions both of an acid and alkaline character are normal products of the mucous membrane of the stomach; the former being furnished by the glands of the fundus and body of the organ, which are lined by spheroidal epithelium, and which furnish the true gastric juice; the latter by those of the pyloric region, whose epithelium is columnar and whose products are those of ordinary mucus, having little or no digestive properties.

The presence of an excessive amount of free acid in the stomach is not, in the majority of cases, due to excessive secretion from its coats; for gastric juice is only secreted in the presence of food, but depends, with great frequency, on unnatural changes in the food, generally of a fermentative character. Acidity from fermentation may arise (1,) in all cases where digestion is delayed from imperfect supplies of gastric juice; (2,) when food in a state of fermentation is introduced into the stomach in quantities sufficient to neutralize the antiseptic action of the gastric juice; (3,) when an excess of mucus possessing a catalytic action is secreted by the stomach; (4,) when proper changes are not effected during mastication in the amylaceous portions of the food by the salivary and buccal secretions; or, (5,) when an excess of starchy or amylaceous substances is taken with the food.

