

injection. After that, except for cold hands and feet, he did well till Christmas time, when again he had an upset. In January he reported that he had had much pain after eating, coming in severe attacks; that not even liquids were retained, until finally some large fecal masses were passed, after which he would recover slowly. He shortly after went for a trip to Old Point Comfort and during the time there ate freely and without distress. On his return he ate an enormous meal just before leaving the steamer and his unpleasant symptoms returned at once. These attacks of pain, while quite severe at the time, were often very quickly relieved with the administration of a high enema or of hot water with 10 to 15 gr. of bromide added.

Another trouble now appeared, large and loose movements of the bowels with much gas and colic. These movements came usually at about 4 to 5 o'clock each morning and were very annoying, as they disturbed his sleep. The stomach examination gave normal amounts of acid and well digested contents. Seen in consultation with Dr. Hewes, it was agreed that the intestinal indigestion was of nervous origin. The examination of the stools failed to disclose any bacilli of tuberculosis. There was a remission in April, when for several weeks the patient attended to his business, with very little discomfort. Then the pain and diarrhea returned. The patient became emaciated, and irritable at times, turning to his business whenever he had a few days' let-up. Variations in diet appeared to have no apparent effect upon his pain or diarrhea. One day at my office, in an attack of pain, his agony was so great that opisthotonos was brought on, and this weak man balanced himself on his head and heels for some minutes. The pain, however, quickly yielded to a small subcutaneous injection of morphia, given then for the first time. Immediately after this he went to the Baptist Hospital, where he could be out of doors a great part of the time and under good nursing supervision. While there he improved during the first few days and was fairly free from pain. He was seen by one of my colleagues who, after going over the case and considering the question of tuberculosis carefully, expressed the opinion that in spite of his appearance he would consider the case a neurosis unless there was a positive diagnosis to the contrary. That same day the fecal examination enabled me to make a positive diagnosis of intestinal tuberculosis, large numbers of bacilli of tuberculosis being found in the stool.

In the hope that there might be a localization of the processes in the intestine which gave rise to the obstructive symptoms, which at no time could be located at any particular part of the abdomen, at my request Dr. G. W. Brewster made an exploratory laparotomy. The first coil of small intestine seen presented evidences of a well marked ulcer and as coil after coil was rapidly lifted, it was evident that the whole small intestine was thickly studded with large tubercular ulcers, and in many places the presence of lymph on the peritoneal surface of the ulcer showed how deep was the ulceration. Just above the cecum there was a thickened mass, where the lumen of the intestine was evidently contracted. This, so far as the hasty examination went, was the oldest lesion and the probable cause of the colic pains, although never had the pains been localized or had there been any tenderness pointing to any particular part of the belly. The wound was immediately closed. The patient died about a week later, a little over a year and a half from the time of the first symptoms.

The case is reported as illustrating the difficulties which may be encountered in deciding between a neurosis and a very extensive patho-

logical process. There was every reason for mental worry and nervous instability. There was the long remission after his marriage, with the return of symptoms after a hard summer's work in financing his new business venture, and the less complete remissions on his vacation and again in March. The irregularity of the attacks of pain, the absence of localizing symptoms, all tended to make the case obscure.

Medical Progress.

PROGRESS IN DERMATOLOGY.

BY JOHN T. BOWEN, M.D., AND HARVEY P. TOWLE, M.D., BOSTON.

LIQUID AIR IN DERMATOLOGY.

THE utilization of liquid air in the field of therapeutics offers another example of the adaptation of a discovery made in one branch of science to the purposes of an entirely different branch. The commercial possibilities of liquid air were fully discussed at the time of its discovery but its use as a remedial agent was not thought of. Recently, however, it has been used with striking results in the treatment of a number of cutaneous affections. The advantages claimed for the method are that it is clean and dry, easy of application and that it produces uniform results with a smooth, thin, pliable, scarcely perceptible scar. The expense, the difficulty of keeping the substance and of obtaining a regular supply are disadvantages so great as to have limited the method to a few localities and to a small number of cases.

Trimble describes the properties of liquid air as follows: "Liquid air is the common air we breathe, very much reduced in temperature. It liquefies at 312° F. below zero. The gases that make up the normal air are practically in the same proportion when the air is liquefied. To the eye the liquid seems to be boiling, giving off fumes similar to those of nitric acid. It is slightly opalescent in color and to the touch feels cold and dry, giving a sensation of tingling. It evaporates rapidly, consequently it can be kept but a short time. We have been unable to keep it at the hospital more than two or three days. Its method of transportation is really a great obstacle as it will explode if corked tightly; therefore a small hole is always left in the stopper from which evaporation goes on." At the present time the liquid air is generally kept in a Dewar bulb which is made up of a larger outside bulb inside which is a smaller bulb. To prevent radiation as much as possible the sides of the bulbs are silvered and the air is pumped from the space between the two bulbs until a vacuum is created.

In the use of liquid air advantage is taken of its property of immediately freezing the tissues with which it comes in contact. Whitehouse says of its effects, that "a drop on the sound skin causes a sensation of burning and tingling and, if allowed to remain a moment or two, will cause a blister. In the absence of moisture no slough nor death of tissue takes place, but on a per-

spiring skin contact immediately ensues and a blister is quickly formed; on a denuded or moist surface a slough with loss of tissue follows. A mild and short exposure to the normal skin by means of the spray produces blanching followed by a moderate congestion; a longer exposure thoroughly freezes and anesthetizes the part but, if not distally situated as the ears, toes, fingers, etc., the circulation is slowly restored without affecting its integrity. It is surprising to see how deeply a part may be frozen without ultimately causing any injurious effects.

"In applications with the swab the resulting inflammatory swelling varies in degree with the amount used, the pressure employed and the location and character of the tissues. If these are firm and well nourished it is often very considerable; while if ill nourished or in a senile condition, irrespective of the age of the subject, a large dose will cause little or no reaction."

From the results of various experiments it would seem that liquid air does not destroy bacteria but that it does temporarily inhibit their activity. The results obtained from its use must, therefore, be referred to its action upon the tissues themselves rather than to its bactericidal properties. The application of liquid air with light pressure produces a temporary contraction of the capillaries with anemia, which is succeeded by a dilatation of the vessels with hyperemia and the outpouring of serum, but without destruction of tissue. A prolonged application with hard pressure causes an intense inflammatory reaction and even an obliterating endarteritis and sloughing of the part. It is apparently by reason of these changes that the results recorded are obtained. It is also stated that diseased cells are more quickly and more profoundly influenced which, it will be seen, is analogous to the action of the x-rays. White's explanation of its beneficial action in diseases of bacterial origin is that "the temporary suspension of the vitality of the germs due to the application of the liquid air gives nature an opportunity to completely destroy them, gives the system a chance to manufacture its antitoxin."

Opinions differ as to the amount of pain caused by the applications. Some writers maintain that there is usually but little pain, whereas others state that it is considerable. It seems probable, therefore, that the presence or absence of pain may be dependent upon several factors, such as the age of the patient, the condition of the tissues, the pressure employed and the duration of the application.

All writers are agreed upon the great importance of the technic. Success or failure depends upon the accuracy of the operator in applying the liquid air to the surface, his skill in applying just the pressure which will accomplish his object without causing unnecessary reaction or damage, and his judgment as to the duration of the application, the proper saturation of the swab and how frequently the treatment should be repeated. Liquid air may be applied either by spray or swab. The latter is usually preferred as it can be

better controlled. A swab is made of a pine stick long enough to reach to the bottom of the bulb by wrapping absorbent cotton about one end. The cotton is moulded to fit the surface of the lesion to be treated, making it flat or round or oval as the case may demand. The swab is dipped into the liquid air until saturated after which the surplus liquid is allowed to drip off. It is then applied accurately to the surface of the lesion with light, medium or hard pressure, according to the intensity of the effect which is desired. The ability to always use the same pressure seems to be the most difficult part of the technic to acquire. Trimble's description of what is meant by light, medium and hard pressure is, therefore, helpful. He compares "light pressure" to the light touch with which the Paquelin cautery is used in lumbago to produce a slight erythema. "Medium pressure" is used when the applicator is held upon the lesion with sufficient firmness to prevent its slipping from its place and hard enough to depress the skin slightly." Another point made is the removal of all crusts before making the application. It is also advisable that all moist or denuded surfaces should be covered with a thin layer of gauze in order to prevent the swab from freezing fast to the surface.

In regard to the amount of pressure to be used in the treatment of the various conditions, light pressure of short duration is employed in such affections as lupus, erythematosis and port-wine marks; medium pressure in pigmented and hairy nevi, angiomas, lymphangioma and lupus vulgaris; and firm pressure of considerable duration—twenty to sixty seconds—in the scattered nodules of lupus vulgaris and in epithelioma. Whitehouse advises that in the treatment of epithelioma and rodent ulcer the pressure should be exerted upon the periphery of the lesion rather than upon the center in order to prevent recurrence. He also uses liquid air as a diagnostic aid in distinguishing the pearly cicatricial nodules, occasionally seen on the periphery of a healed lesion, from true epitheliomatous nodules, relying upon the fact that the diseased tissue is frozen while the scar tissue is not appreciably affected.

The time when the application should be repeated demands the exercise of considerable judgment, for if the treatment is given too frequently it intensifies the reaction and causes unnecessary destruction of tissue. It is agreed that the best results are obtained when the operator proceeds slowly. Therefore, it has become the rule to wait until the effects of the first application have entirely passed off before making the second. Some, indeed, wait until the crust resulting from the preceding application has fallen before giving another treatment. It is claimed that if the operator is skillful, superficial affections may be removed with practically no scarring, and deeper affections with a scar which is so thin and pliable as to be scarcely noticeable. It is said that it is only when the applications are too long continued and the pressure too hard that tough, irregular scars result.

A brief résumé of some of the cases reported will give the best idea of the character of the cases in which liquid air is used, the method employed and the results obtained. For example, Trimble reports eight cases of hairy, pigmented nevi. Case I was a boy, aged eleven, with a brown, very hairy, pigmented lesion one and a half inches long and one-half inch wide, situated upon the upper eyelid. After four applications the hair began to disappear, ulceration commenced and a crust formed. Healing took place beneath the crust leaving a practically normal skin. Case II, a girl, aged five, presented on the cheek near the angle of the mouth a deeply pigmented, hairy lesion of the size of a twenty-five-cent piece. Six applications were made, the last causing some inflammation. The result was good, only slight scarring resulting. Case III, girl, aged sixteen; nevus of mouse-skin variety on side of nose, three fourths of an inch long and one-half inch wide, covered with long hair. After seven applications there remained only a healthy scar with slight pigmentation at one point. Case IV, girl, aged six; pigmented lesion on right temple. Three applications resulted in a smooth white scar which was scarcely noticeable. Case V, woman, aged twenty-four; lesion on left lower cheek, pigmented and covered with thick, reddish-brown hairs; size of a twenty-five-cent piece. Five applications removed the lesion with the exception of one small spot in the center. Case VI, boy, aged seventeen; dark brown nevus on cheek, size of twenty-five-cent piece; covered with coarse brown hair. Six applications cured with very mild scarring. Case VII, girl, aged twenty; nevus about the size of a five-cent piece, under the chin; black and covered with coarse black hairs. Entirely removed by seven applications except for one patch the size of the head of a match and with practically no scarring. Case VIII, girl, aged twenty; mouse-skin nevus, size of ten-cent piece, on the shin; central portion verrucous and projecting one-eighth inch above the surface. Four applications cured without remaining pigmentation and without a noticeable scar. All of these cases remained under observation for over a year and none showed any sign of recurrence.

Whitehouse reports three cases of pigmented nevi and two cases of hairy nevi in which his results were similar to those of Trimble. In addition he reports cases of vascular nevi, lupus erythematosus, lupus vulgaris and fifteen cases of epithelioma. As a result of a single application, a *vascular nevus*, the size of the finger nail, situated on the nose, disappeared completely within three weeks, leaving a smooth flat scar. Three months later there was no sign of a return. A port-wine mark on the nose, twice the size of the last, disappeared within three months after eight light-pressure applications, leaving a very superficial, atrophic-looking scar. No return. An irregular vascular nevus over the angle of the jaw and the adjacent part of the neck was removed by six applications and showed no signs of return after two years. In a case of *lupus erythematosus* of

three years' duration, one patch on the cheek the size of the thumb nail was cured by three applications and another, slightly larger, indurated patch on the nose by five or six applications with smooth, superficial scars. In a second case a patch of one and a half years' duration, situated on the temple, had been almost completely removed by six applications with moderate pressure, when the patient disappeared. A patch of *lupus vulgaris*, nearly one inch in diameter, of three years' duration, was completely cured by one fairly severe, one moderately severe and two milder applications, leaving a smooth, pliable, but slightly depressed scar. No tendency to recurrence shown two years later. In another case of *lupus vulgaris* five isolated tubercles remained of a patch which had been previously treated by other measures. Deep boring with a pointed applicator destroyed the tubercles but produced a marked reaction. Sixteen months later there was a questionable recurrence of one tubercle which one application would cure. The fifteen cases of *epithelioma* were of the type commonly seen about the head and face and unaccompanied by glandular involvement. The following will serve as examples. An epithelioma, one quarter of an inch in size, was cured by a single application with firm pressure and showed no recurrence a year and a half later. Two other cases of the same size were also removed by one application. Thirteen months later one showed two pin-head recurrent nodules which were attributed to a tag left attached at the time of the first application. The second showed no return. Several other cases, varying in size from one quarter to three quarters of an inch, were cured by from one to four applications and showed no return in from two to three and a half years. An excavation involving almost the whole width of the lip and extending into the mouth was left by the removal of a fungating growth by Marsden's paste. Nine severe applications of liquid air were then made to the mucous surface. A group of nodules developed on the chin at a distance from the original growth. Two applications were made to the nodules and two to the original growth, making eleven in all. Three months from the first application the whole had healed perfectly with a scar level with the surface. The lip was slightly shortened but the contour was not affected.

The above cases are sufficient, without detailing similar cases reported by other men, to show the striking results obtained by the use of liquid air. Certainly they are not equalled by any other method with the possible exception of excision. Unfortunately the general use of liquid air is impossible because of the very great difficulty of obtaining it. Its employment at present is almost confined to New York, and even there it is sometimes difficult to secure a regular supply. It is to be hoped that some method will be invented which will render its production commercially profitable and thereby bring it within the reach of the profession generally.

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Reports of Societies.

AMERICAN GASTRO-ENTEROLOGICAL ASSOCIATION.

TENTH ANNUAL MEETING, HELD AT ATLANTIC CITY, N. J., JUNE 3 AND 4, 1907.

(Concluded from No. 16, p. 535.)

GASTRIC DISTURBANCES CAUSED BY HERNIA.

DR. MAX BALLIN, of Detroit, Mich., read this paper. He stated that any and every kind of hernia caused more or less gastric or intestinal trouble. The common large inguinal herniæ, if reducible, were responsible for flatulence, constipation, pain in the back and groins; if adherent, all these symptoms became more pronounced. Omental adhesions in a hernial sac could make a patient so miserable by loss of appetite and indigestion that serious loss of weight resulted, and there were cases of supposed malignant disease, where afterwards radical operation of the hernia removed all the intestinal disorders. It should be borne in mind that if in a hernia any adhesions existed between the hernial sac and its contents, a truss would usually aggravate all the symptoms by pressure on the unreduced parts. Generally speaking, in adherent hernia, a truss was contra-indicated. Wherever located, post-operative ruptures were most troublesome to the patient, but Dr. Ballin said that the main object of his paper was to call attention to intestinal disorders caused by small herniæ that were not easily discovered. Of these he considered in detail four kinds, namely: 1. The so-called incomplete inguinal hernia; (2) the small femoral hernia; (3) umbilical hernia; (4) epigastric hernia, in or lateral to the linea alba, and peritoneal lipoma. Under the latter heading he included hernia protruding in or close to the linea alba, between the xiphoid process and the umbilicus. These herniæ occurred very rarely below the umbilicus, and were apparently due to congenital or acquired defects in the linea alba, although some claimed that loss of fat was an important factor in their etiology. Others claimed that just the opposite, adiposity, predisposed to such weakness, the fat replacing to some extent the resistant fibrous tissue. Epigastric hernia and lipoma might exist for many years without causing any symptoms. Then, suddenly, symptoms might arise, the chief one being pain. Usually, these epigastric herniæ, on account of their size and the peculiar lipoma formation and adhesions, were not benefited by trusses and bandages, and a surgical operation was indicated. In conclusion, Dr. Ballin said that many cases of obscure abdominal trouble, colics and vomiting, could be caused by hernia, and that it was very important to look in all such cases for small ruptures. These could be of any of the known varieties, but of special importance in producing gastric symptoms were the small epigastric herniæ and the peritoneal lipomas.

DR. MAX EINHORN, of New York City, said that, according to his experience, these herniæ, especially those of the epigastric variety, were very frequent indeed. He probably saw three or four every week, and he did

not think that one half or even one third gave rise to any symptoms. In the majority of these cases he ignored the hernia entirely, and considered it a mistake, sometimes, even to call the patient's attention to its existence.

DR. J. A. LICHTY, of Pittsburg, said he had seen only two cases of epigastric hernia, and in those two instances the patients did not complain of any symptoms referable to the hernia.

DR. J. C. JOHNSON, of Atlanta, said that in a case of epigastric hernia which he saw recently the chief symptom was periodical attacks of pain. This was the only case of epigastric hernia he could recall among several thousand examinations.

DR. G. W. McCASKEY, of Fort Wayne, said he was greatly astonished at the frequency with which Dr. Einhorn met with cases of epigastric hernia.

DR. A. L. BENEDICT said the statements made by the various speakers in regard to the frequency and infrequency of epigastric hernia showed either the personal equation or a peculiar coincidence. Personally, he saw these cases rather frequently, perhaps one every week or two; some of them good-sized epigastric herniæ; others so small that they could scarcely be called herniæ, but rather epigastric finger-points. He had never seen a single case in which the symptoms could be attributed to the hernia itself.

DR. I. ADLER, of New York City, said he wished to protest against the statement that epigastric herniæ were so very frequent. The stomach symptoms in these cases were not necessarily due to the presence of the hernia. Occasionally, however, an operation on such a hernia would act as a suggestive measure and relieve the symptoms, but there were still other cases where he agreed with Dr. Ballin that an operation was necessary, particularly in those cases where there were inflammatory adhesions.

DR. S. J. MELTZER said it was not only incomplete herniæ that were liable to give trouble, as the simple pressure of the intestines against a patulous internal ring or against some diastasis in the abdominal muscle was not infrequently the cause of such pains, which were always relieved by the application of a well-fitting truss. Doubtless, there were some cases of incomplete herniæ which were not relieved by trusses; but even if a truss was effective, why should a man wear a truss for thirty years or more when he could be radically cured in less than a fortnight?

DR. CHARLES D. AARON, of Detroit, said a case of epigastric hernia which he reported ten years ago was that of a man who had been an invalid practically for fifteen years, because of an epigastric hernia about the size of a marble, with an opening into the linea alba scarcely larger than the point of a pencil. He was completely relieved by an operation. These cases were not the kind where the opening was large enough to admit even the finger-tip, and replacement was impossible.

DR. J. KAUFMANN, of New York City, thought there were cases of epigastric hernia which gave rise to serious trouble and which could not be cured by putting the patients to bed. In any case that was giving rise to symptoms, he would certainly advise an operation.

The discussion was continued by Drs. J. Fuhs, of Brookline, G. W. McCaskey, of Fort Wayne, and was then closed by Dr. Ballin.

THE GASES OF THE INTESTINE, WITH DEMONSTRATION OF AN ORIGINAL APPARATUS FOR THE COLLECTION AND ANALYSIS OF STOMACH AND INTESTINAL GASES.

By DR. S. BASCH, of New York. The author stated that the study of the intestinal gases possessed interest mainly as a physiological and chemical problem, but the important rôle which they played in a number of