hold slops by applying them to the *top* of a different piece of cultivated ground every day. Whether an ordinary watering-pot or a tank upon wheels drawn by a horse be necessary for accomplishing this latter object will depend upon the size of the establishment; but only those who have systematically pursued this plan, as I have done, can know the vigour which is imparted to hedge-rows, shrubberies, fruit trees, or forest trees, by a tolerably frequent dose of household slops. There is no difficulty in doing this, provided the will be present—the will, that is, to combine your duty towards your neighbour with an act which is profitable to yourself.

I am addressing myself to dwellers in the country, but I should like to say to town dwellers that complete sanitation is impossible, unless cultivated land be brought into tolerably close relationship with the dwelling. At present our sanitary arrangements are magnificently begun and seldom completed, and while we almost uniformly leave a most dangerous loose end to our sanitary measures, we shut our eyes to it and blow the trumpet of self-satisfaction as if the sanitary millennium had begun. The Allotment Act, as affording an outlet for organic refuse, ought not to be without its effect upon sanitation, and it is to be hoped that the masses will some day wake up to the great importance, from the moral and sanitary standpoint, of providing every dwelling with an adequate outlet. As things go at present, I have very little doubt that the agricultural labourer with his cottage and garden and 12*s.* a week is infinitely better off than the town artisan on 25*s.*, who pays dearly for pigging it in overcrowded rooms, in which a cleanly and decent existence is impossible. I have been reading the last volume of our Transactions, and in it I find a very interesting paper by Dr. Sykes, who quotes Dr. Corfield, who, in his turn, is quoting Sir Henry Acland, to the effect that the disappearance of the great cities of antiquity was due to pestilence rather than war. We must all admit the possibility of such an assumption, and certainly no one can ponder upon the disappearance of Egyptian, Babylonian, Assyrian, Greek, and Roman civilisation without speculating upon the cause, and without applying the lesson to ourselves and asking ourselves how much longer is our British civilisation to continue? Nationalities seem as mortal as the individuals who compose them. If great nations are destroyed by neglect of sanitary laws, and if prolonged national life is indicative of sound sanitary measures, there is at least one race upon the globe which is worthy of profound study by all who concern themselves with public health. This race is the Chinese, who have seen all the great nations of antiquity in and out, who were probably a great people in the days of Moses and before, and whose thrifty myriads are even now successfully contending with the Anglo-Saxon race in America and Australasia. The Chinese, as is well known, have had to contend with national calamities of a most stupendous kind. In our own days we hear of floods and famines which claim their millions of victims, and yet the race continues to increase in such a way and to overflow its natural boundaries to such an extent that it is certain, even without the exact returns of a registrar-general, that the birth-rate must very considerably exceed the death-rate, and must have done so in an average way during the three or four thousand years that the Chinese nation has existed. I think there is no doubt that, unless we mend our ways, the Chinese will see us out, as they have seen the other great nations of the world out, and the reason, I believe, is obvious. The Chinese are the most thrifty nation in the world. In China nothing is wasted, and all organic refuse is ultimately returned to the soil. Agriculture is in China a sacred duty, and the Chinese have got a firm grasp of the elementary principle that if the fertility of the earth is to be maintained we must constantly replenish it.

The question of our duty to the soil is fundamental in sanitary matters. If we starve the soil and turn our fertilising materials into the sea, we may rid ourselves (though this is doubtful) of filth diseases for a time; but it is by no means doubtful that we shall ultimately replace filth diseases by those diseases that are bred of starvation. How soon this will happen no one can say, but that it will happen eventually seems to me as certain as is the axiom, "ex nihilo nihil fit." Do not let us commit the great blunder when dealing with this national question of forgetting that the life of a nation ought to be measured by centuries. Do not let us make a suicidal use of a paltry fifty years' statistics, and because the figures of the last decennium happen to be favourable conclude therefrom that all our sanitary principles are right. The Chinese principle of returning all organic refuse to the soil is, there can be no doubt, absolutely sound. The Chinese details may be filthy and susceptible of improvement. In this country the details of our domestic sanitation are refined, elegant, and ingenious. It is the principle subserved by these details which I believe to be absolutely rotten. The main problem of sanitation is to cleanse the dwelling *day by day*, without fostering starvation. This can only be done by returning all organic refuse to the soil, and the perfecting of the details by which this duty is to be done is the most important work of the modern sanitarian. This question has an immediate personal interest for all who derive their income from the soil. I feel sure that the clergy would do well to enforce by example as well as by precept the old injunction, to "replenish the earth and subdue it." If they do not they must expect to go without their tithes. Improvement in this direction is only to be attained by rousing the public conscience. So soon as the majority of individuals is impressed with the fact that it is wicked to foul our streams and starve the soil, and that our individual responsibility does not end, even though the fouling and starving be done by a "board," so much the better will it be for the public health and national wealth. Parliament has compelled us to hand over our responsibilities to public authorities, with the consequence that the individual has lost his liberty and independence, and is drifting into a condition of sanitary imbecility. Let us not forget that the present state of our rivers is the direct result of Acts of Parliament. Let us not forget that Parliament, which wasted its time and our money in passing that most inoperative of all Acts, the "Rivers' Pollution Act," scavenges its own palace direct into the Thames; as though Imperial Parliament could hand over its responsibilities to a local board! It is hardly credible that such a condition of things could exist outside the libretto of a comic opera. A respect for the purity of water should be enforced in our Board schools and churches; and that powerful party in the State—I mean the temperance party—would do well to devote some of its energies towards ensuring that the beverage which it champions should be in all places a safe one to drink. As it is, one has only to walk about the country to see that our streams and rivulets are universally regarded as receptacles for rubbish and impurities of every kind. This question, I must reiterate, in conclusion, is a national one of the first importance. A nation that fouls its streams and starves its soil is in danger of poisoning and inanition. A nation which imports a great part of its food and a great part of its manure, and systematically and by Act of Parliament throws all its organic refuse into the sea, is obviously living on its capital. Our capital just now is undoubtedly considerable, but we are in a fair way to run through it; and when we have done so, who can forecast the future?

SURGERY OF THE LATERAL VENTRICLES OF THE BRAIN.[1]

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AFTER alluding to the fact that puncture of the brain for the relief of hydrocephalus dates back to 1744, in the case of Dean Swift, Dr. Keen pointed out that the former operations were done through the anterior fontanelle, and not by trephining. In 1881 Wernicke first proposed to trephine and puncture the lateral ventricles. This proposition was enforced by Zenner of Cincinnati in 1886. On Nov. 7th, 1888,[2] Dr. Keen read a paper before the College of Physicians of Philadelphia, in which, in ignorance of these earlier propositions, he proposed to trephine, puncture, and drain the lateral ventricles. He was led to this by a case of exploratory trephining for supposed abscess of the temporo-sphenoidal lobe. The necropsy showed that there was distension of the lateral ventricle in consequence of tubercular menin-

[1] Résumé of a paper read before the Tenth International Medica Congress, Berlin. [2] Medical News, Dec. 1st, 1888.

gitis, and that the drainage-tube had reached to within a quarter of an inch of the ventricle, and had not produced any inflammation. He pointed out the fact that the brain would bear pressure much less well than the other viscera, and hence the need for early trephining. He then reported the following three cases of his own.

CASE 1.—A boy aged four years was threatened with blindness from acute hydrocephalus. This condition was judged to be due probably to tumour of the cerebellum, though on which side was doubtful. Dr. Strawbridge had examined the eyes, and had found that there were choked discs with retinal hæmorrhages and swelling. The swelling of the disc measured 2·30 mm. in each eye, and, in view of the rapidly increasing blindness, Dr. Strawbridge brought the child to Dr. Keen for the performance of an operation. This was done at the Woman's Hospital, Philadelphia, on Jan. 11th, 1889. A puncture was made at a point one inch and a quarter behind the left meatus, and the same distance above Reid's base line. A half-inch button of bone was removed and the brain punctured by a hollow needle (No. 5 French catheter scale), which was inserted in the direction of a point two inches and a half vertically above the opposite meatus. At about an inch and three-quarters the resistance suddenly ceased, and the cerebro-spinal fluid began to escape. Three stout horsehairs, doubled, were then passed into the ventricle. No phenomena occurred during the operation. The highest temperature that followed the operation was 101·2° for a very brief interval, but most of the time it was normal. In two days the swelling of the optic nerves had fallen to 1 57 mm. and 1·63 mm. in the right and left eye respectively, and by the sixth day to 1·09 mm. in both eyes. By the seventh day the swelling of the optic nerve had increased, and the drainage was not very free. The tumour was sought for by probing through the drainage opening into the occipital lobe, almost to the occipital bone. No tumour being found by probing, an opening a quarter of an inch in diameter was gouged in the occipital bone below and to the left of the inion. The cerebellum was explored by a probe to the depth of two inches and a quarter in the direction of the left lobe, and again obliquely across into the right lobe, but no tumour was found. This wound healed by first intention without any fever. On the fourteenth day the horsehairs were removed, and a small rubber drainage-tube was inserted into the ventricle in order to give freer vent to the fluid. This was attended by no pain or discomfort. By the twenty-eighth day the child had become somewhat restless, and the swelling of the discs, which had fallen to 0·83 mm., had again increased to 1·33 mm. in each eye. Accordingly, the right side of the skull was trephined at the corresponding point above and behind the ear, and the occipital lobe was punctured to the tentorium, but no tumour was found. A drainage-tube was then passed into the right ventricle directly, being inserted without the prior puncture by a hollow needle. On the thirty-second day, by a fountain syringe, the bag of which was raised about six inches above the head, the ventricles were irrigated from side to side with warm boric acid solution, four grains to the ounce. While the connexion was being made with the tube, the child was a little restless, but as soon as the warm water began to flow into the brain he became quiet, and said that "it felt good." The fluid escaped from the opposite side slowly. The bag of the syringe was then elevated until the escape became quite free, but never reached a continuous stream. It was estimated that about eight ounces passed into the ventricles, of which about two ounces escaped from the opening on the opposite side and about six ounces were retained. No phenomena whatever were apparent during the process described, saving the comfort shown by the child. On the thirty-fourth day the ventricles were again irrigated from side to side with plain boiled water, which gave less relief than the boric acid solution, but produced no ill effects. A few days later the child was evidently not so well, and died on the forty-fifth day, the first drainage-tube having been in place nearly all that period. At the necropsy the cerebro-spinal fluid was perfectly clear; more so than that which was obtained at the first tapping, which was slightly turbid. The ventricles were greatly distended with fluid. There was found in the left lobe of the cerebellum a sarcoma, which had compressed, as was suspected, the straight sinus and the veins of Galen, and had encroached on the fourth ventricle. The sinuses through which the rubber tubes passed were not surrounded by an inflammatory zone. There was no injury of the opposite wall of the ventricle, and no trace of the punctures made in the cerebrum or cerebellum. The oblique puncture made in the latter had gone through the tumour, which, however, was too soft to be perceived.

CASE 2.—A boy aged three years and a half. Hydrocephalus set in four or five months after birth. His mental condition was extremely poor. On March 5th, 1889, the left ventricle was tapped in a similar manner as Case 1. At a depth of an inch and a quarter the resistance suddenly ceased, and the cerebro-spinal fluid immediately escaped. As in the first case, the fluid was slightly turbid. Drainage by horsehairs, as formerly, was not very effective. The highest temperature immediately after the operation was 100·2°, and there was marked increase in the use of the right arm, which had been paretic. The drainage being insufficient, on the fourth day the ventricle on the opposite side was opened, and a small drainage-tube inserted in both ventricles. These were stopped by disinfected plugs of wood, with a V-shaped slot cut in each, so as to allow of the escape of the fluid at about thirty-five drops a minute. As this seemed to be too free after four hours and a half, other disinfected plugs were inserted with smaller slots. Convulsions set in the next day. As soon as Dr. Keen reached the patient, he found the convulsions constant, so he decided to replace the drained fluid, and, having no time for the preparation of an artificial cerebro-spinal fluid, he used plain boiled water. This was syphoned from a height of about three inches. As soon as the warm solution began to flow into the ventricles the spasms ceased. The flow was then immediately stopped by squeezing the tube, and in a few minutes the convulsions returned. They were immediately arrested again by slight syphonage of warm water. Eight times the convulsions returned, and each time they were arrested by a syphonage of about half an ounce to an ounce of fluid. Dr. Keen estimated that the amount of fluid injected was nearly a pint. No further spasms occurred, but the child gradually failed, and died in the afternoon. The necropsy showed great hydrocephalic distension, but no injury from the operation.

CASE 3.—This was a case of tubercular meningitis with unilateral acute internal hydrocephalus of the left ventricle. The foramen of Munro, as the necropsy showed, was closed. This closure was attended by unilateral distension and produced right hemiplegia. In this respect the case is probably unique. The left ventricle was tapped through the arm centre. The child was almost *in extremis* when it was done, and died about four hours after the operation. At this operation it was equally easy to determine when the ventricle was reached.

Dr. Keen next referred to the case of von Bergmann, in his "Surgical Treatment of Brain Lesions," as the first case ever operated upon, though not published until after his own paper; and a note on his first case. An operation was performed in this case on July 15th, 1887, by the anterior route, and proved fatal on the fifth day. He described the next two cases reported to him by letter by Mr. Mayo Robson of Leeds.

A girl aged ten, without preceding illness, began to have pain in the left ear, and was feverish on Dec. 19th, 1888. In three days a discharge followed, which gradually lessened, but was still present a month later when admitted to the hospital. There had been also rigidity of the neck and twitching of the right angle of the mouth. No vomiting. Slight mental disturbance. On admission (Jan. 19th, 1889) the temperature was 105°; there was pain in the left side of the head; paresis of the right arm and leg, gradually developing into complete hemiplegia and aphasia; and the optic discs were inflamed. An operation was performed on Feb. 7th, 1889, by trephining over the arm centre. The dura was healthy. On exposing the brain, it did not pulsate, and seemed to be compressed. Exploring needles were passed deeply in various directions, with the expectation of reaching pus, but failing to find any the needle was pushed on into the lateral ventricle, and half an ounce of clear fluid drawn off, after which pulsation returned in the brain. The wound was closed as usual, no drainage being employed. The next day there was slight power in the arm, soon after in the leg, and on the third day she could answer simple questions. Within a month the hemiplegia was gone. Six months later she was perfectly well. Even half an ounce of fluid seems to have imperilled life by pressure, and the operation undoubtedly saved her life—a most important and encouraging lesson for the future.

Mr. Robson's second case was one of an infant who was trephined for quickly increasing hydrocephalus following treatment of spina bifida by Morton's injection. The skull was trephined an inch in front of the Rolandic fissure over the second frontal convolution. The dura was opened and an exploring syringe inserted into the ventricle, which was reached an inch from the cerebral surface. By Lister's sinus forceps a rubber drain was inserted along the needle as a guide. The drainage was so free that it wet the dressings and ran on the floor, and the patient seemed much relieved. The drainage soon became less free, and on the third day the child died in convulsions. The post-mortem examination showed that the brain had shrunk so much that the end of the tube was lying between the dura and the brain.

Dr. Keen alluded next to the case of Ayers and Hersman, in which, on Dec. 4th, 1888, puncture was made over the coronal suture an inch and a half to the middle line. The operation was repeated on April 28th, 1889, by Dr. Hersman. The first operation was followed by the escape of from four to eight ounces of cerebro-spinal fluid and evident improvement. At the second operation no fluid was found in the ventricle, and the child was very much improved.

Of the seven cases thus far reported, two have recovered and five died—a mortality of 71 per cent.—which, for a new operation and for so extremely dangerous a condition, is far from discouraging, especially Mr. Robson's first case.

Dr. Keen then entered into the question of the technique of the operations, and pointed out that it was neither difficult nor dangerous, that the rules he had laid down in his former paper[3] had proved to be correct, and that in his judgment the lateral route is the best, except in special instances. From his experience in these three cases, he urges that the puncture be made by a cannula (No. 13 French catheter scale), and that the drainage shall not be done by a tube, but by a sufficient bundle of horsehairs, and that too much haste shall not be used in draining off the fluid, as such haste may perhaps cost the life of the patient, as in Case 2.

Dr. Keen next took up the question of hæmorrhage into the ventricles, and referred to the following case, reported to him personally by Professor Frederic S. Dennis of New York. It is the first case in which a clot has ever been removed from the lateral ventricle.

A man, aged thirty-six years, was struck on the right side of the head by a falling ladder, but was not rendered unconscious by the blow. An hour after admission into the hospital his left arm became paralysed, and later the face and leg also. A diagnosis of cerebral hæmorrhage was made, and six hours after the accident he was operated on. A linear fracture without depression was discovered. Trephining was done over the arm centre. No epidural and no subdural clot was found, nor was any clot found when the brain tissue was incised. Accordingly, an incision was made directly into the ventricle, and when the retractors were slightly separated a blood-clot about the size of a pullet's egg shot out of the ventricles with force enough to land several feet from the patient's head. Gentle irrigation and drainage were employed, with the ordinary care of the wound. The patient never recovered from the paralysis, became delirious, and died comatose in three days. The necropsy confirmed the diagnosis, and also that there had been great laceration of the cerebral substance, to which fact death was due. There was no meningitis, and no suppuration.

Dr. Keen then narrated four cases of abscess bursting into the lateral ventricle, beginning with the historic case of Detmold in 1849, and added three other cases by Pancoast, Morehouse, and Norton. All of the patients died, as might be presumed to be the case from so dangerous an accident.

The next series of cases were those due to rupture of the ventricles by compound fracture. Two cases were referred to—one of Nassa the other by Hewitt—in both of which the lateral ventricles were torn primarily, and there was free discharge of cerebo-spinal fluid. Both of these cases recovered.

Of secondary opening of the ventricles, Dr. Keen gave six cases by Bouchacourt, Berenger de Carpi, Erichsen, Rodenstein, and himself. Strange to say, four of these six cases recovered.

[3] Ibid.

Five cases of rupture of the lateral ventricles, from simple fracture of the skull, were also referred to, one each related by Thompson, Haywood, Erichsen, and two by Lucas. All of these patients were young children, five years of age and under, and all showed secondary soft swelling under the scalp, with the removal of the cerebro-spinal fluid, either by tapping or, as in one case, by rupture. Of the five cases three recovered.

After consideration of the entire subject the following conclusions were reached:—1. Injuries involving the ventricles, the result of compound fracture or of trephining, and involving great disturbance of the cerebral substance, are not necessarily fatal, for ten of the twenty-six cases here reported have recovered. In these few cases compound fractures and extensive injuries, unless primarily fatal, seem to be less dangerous than rupture of the ventricles from simple fracture. They should be treated antiseptically in precisely the same manner as wounds in other parts of the body, by the establishment of asepsis, drainage, and the usual later treatment of similar wounds in other regions. If pus follows, or the cerebro-spinal fluid becomes dammed up, causing symptoms of pressure, incision and free drainage should be resorted to. 2. In cases of simple fracture involving the ventricles, experience would seem to indicate that it would be wise not to attempt any operative procedure unless threatening symptoms supervene. If necessary to interfere, it is recommended that the cyst containing cerebro-spinal fluid be continuously and slowly drained by a small bundle of horsehairs, rather than by freer evacuation. But it is believed that, in the majority of cases, constant pressure and but little active treatment would meet such symptoms as might arise. Possibly slight pressure would be all the treatment that would be necessary. 3. Abscess of the brain bursting into the lateral ventricle has been thus far uniformly fatal, and demands the promptest treatment possible. The suggestion made for instant bilateral trephining and irrigation of the ventricles can at least do no harm, although the possibility of its doing any good is but slight in so fatal a condition. 4. Hydrocephalus, whether acute or chronic, is usually a fatal disease. 5. Surgical procedures for tapping the ventricles for its relief are easy, and certainly do not *per se* involve great danger. 6. Whether they will cure the disease is as yet not determined. In acute effusions, tapping, with or without drainage, as may be thought best, will certainly save some lives otherwise doomed to be lost, and in the chronic form long-continued slow drainage at an early period is at least worthy of trial, with a reasonable hope of success in a few cases. 7. The methods above described for performing the operation, especially by the lateral route, might be resorted to, with a view of determining the value of such surgical procedure. 8. After trephining and tapping of the ventricles irrigation of the ventricular cavities from side to side is not only possible, but does no harm. In abscess involving the ventricle, and possibly in other conditions, it may possibly do good. The fluid used for such irrigation should not contain anything which if retained and absorbed might do harm. An artificial cerebro-spinal fluid or a simple boric acid solution would seem to be the best for such use. 9. Convulsions, due to too rapid withdrawal of the cerebro-spinal fluid, may be checked by re-injection of an artificial cerebro-spinal fluid, or such other innocuous fluid as the circumstances may make available. 10. In either irrigation or injection of the ventricles it is probably desirable that the air should not enter, but such entrance of air does not seem to be productive of mischief. 11. In hæmorrhage into the lateral ventricles, at least of a traumatic origin, instant trephining and evacuation of the clots should be done, and in a few cases will probably be followed by a cure, unless the injury of the cerebral tissue is such as to be incompatible with life.

COMMENDABLE ESPRIT-DE-CORPS. — At a recent meeting of the Horsham Guardians it was decided to reduce the salary of one of the medical officers by 12½ per cent. Mr. Kinneir, the officer in question, refused to accept the reduction, but agreed to continue his duties till his successor was appointed. On the vacancy being advertised in several journals, not a single application was received. A proposition that the post should be again advertised was defeated by 10 votes to 6. A motion will be made to have Mr. Kinneir reappointed.