ago on Chorea in Pregnancy (*Obstetrical Transactions*, 1868), I adduced reasons for concluding that the graver symptoms—the paralysis, the mania, death—were produced by the repeated shocks of convulsion.

No one who has watched a case of puerperal convulsions, or of obstinate vomiting, or tetanus, or who has himself experienced the torture of sea-sickness, can have failed to observe how each repetition of the fit weakens the power of resistance, rendering the nervous centres more and more susceptible to those impressions which started the affection. This increasing susceptibility is obviously the result of shock, aggravated no doubt by exhaustion from want of food.

In the case of tetanus, it can hardly be questioned that the fatal prostration is almost purely the result of the repeated shocks. The blood-poison, if any exist, and I believe it does, mainly acts by increasing central nervous irritability; it scarcely complicates the problem; and the mind often remains singularly clear. In uræmic convulsions, again, notwithstanding the complication with blood-poisoning, the effect of shock is clearly seen in the exhaustion following the fit, in the general muscular resolution, in the relaxation of the sphincters, and in the gradual return of nervous power during the intervals, under the influence of rest. I have seen almost sudden death in labour which could be ascribed to no other cause than the shock of pain, and the convulsive action of the uterus. In some cases of paraplegia arising in labour it seems reasonable to attribute the paralysis to exhaustion or shock upon the spinal cord. It is certain that some of these cases cannot be accounted for on the theory of pressure upon the nerves in the pelvis.

The increasing or progressive influence of successive shocks partly explains what is comprised under the idea of "habit." "Habit" is a vague term. In the case of convulsive disease it implies—first, increased susceptibility to external and to emotional impressions; second, altered periodicity in the renewal of nerve-force. This increased susceptibility seems to be produced by repetition of shock or fit. We have one very interesting practical application of this law in obstetrics. When we induce labour prematurely in a woman for the first time we often find the nervous irritability insufficient to complete the labour promptly, and it becomes desirable to supplement defective natural power by operative aid. But in each succeeding pregnancy the nervous centres respond more and more easily to the artificial provocation, so that when labour has been brought on three or four times at the same stated period of pregnancy, it seems as if that stated time had become the normal term of gestation. Such is the altered periodicity in the preparation of the requisite nerve-force produced.

It is greatly by the influence of shock that I would account for the cerebral disorder which often attends the progress of puerperal convulsions, of epilepsy, and of chorea. The fits act as repeated shocks which stun the nervous centres. These shocks are equivalent to concussions. The *ictus epilepticus* is as real a blow as the apoplectic stroke. They exhaust and divert the nervous force, and after a time impair the nutrition of the nervous substance.

In the case of chorea proceeding to mania, we have to note that the cerebral disease is almost always *secondary and progressive*. In cases in which the chorea is evoked by fright, some mental disturbance may be noticed at the onset, whilst in other cases there may at first be little or no such disturbance. But soon irritability of temper, a certain peevishness or waywardness, a loss of balance, impairment of memory, sometimes, of articulation, follow. An aspect of stupidity betrays a real loss of intelligence. At first these defects are slight, but they gradually increase in severity, occasionally to the extent of ending in delirium or furious mania.

In cases of puerperal mania breaking out after labour, where there has been no convulsion, it may seem that some other factor than shock must be invoked. In some of these cases there is albuminuria: that is, there is blood-poisoning; and this may be taken to be the chief factor. But in other cases there is no albuminuria. But in all there is the shock of labour, with its attendant exhaustion, its severe physical and psychological revolution, acting upon a nervous system wrought up to a climax of irritability. It seems to me that convulsions, collapse, insanity, are not, indeed, interchangeable or convertible, but that the issue in any one of these conditions is determined by idiosyncrasy, or antecedent peculiarity existing in the nervous centres.

THE PRIZES OF THE PARIS FACULTY OF MEDICINE.—The Faculty of Medicine in Paris has divided the Chateaubriard prize of 2,000 francs equally between Dr. Luys, for his *Researches on the Structure of the Encephalon*, and Dr. Legrand du Saulle, for his work on the *Delirium of Persecutions*. The Lacaze prize has been awarded to Dr. Pidoux, for his *General and Practical Studies of Phthisis*; and M. Lépine receives honourable mention for his treatises on *Casous Pneumonia* and on the *Unity of Phthisis*.

CLINICAL LECTURES

ON

MENTAL AND CEREBRAL DISEASES.

By J. CRICHTON BROWNE, M.D., F.R.S.E.,

Medical Director, West Riding Asylum; Lecturer on Mental Diseases to the Leeds School of Medicine; etc.

IV.—CANCER OF THE BRAIN.

GENTLEMEN,—On the table before me lies a brain presenting some unusual appearances. You see, on looking at it from above, that it is very unsymmetrical, and that there is a remarkable bulging or swelling in the middle of the left hemisphere. In this swelling are involved the whole of the convolutions of the left parietal lobe—the ascending frontal and the posterior extremities of the three tiers of frontal convolutions. These have all an expanded and flattened appearance, as if they had been pushed out and distended by some force acting from within, and together form a tumour, not well defined in front, but accurately bounded above by the median fissure, below by the horizontal limb of the fissure of Sylvius, and behind by the external parieto-occipital fissure. This tumour, which is of the size of an orange, feels firm and elastic to the touch in some places, and pulpy in others, especially in its lower third, where its surface has an eroded ulcerated appearance, and is of a reddish-grey colour. On its surface, the outlines of the convolutions involved in it are distinctly visible beneath the arachnoid and pia mater, which are much attenuated, and which cannot be traced over the eroded or ulcerated area. Apart from this tumour, there is nothing very remarkable in the brain externally. The arachnoid is not thickened nor cloudy; the pia mater strips freely; the convolutions are not wasted—on the contrary, they have everywhere a compressed or flattened appearance; there is no atheroma of vessels. On removing the upper half of the hemispheres by a section which has been made through the centre of the tumour, in a line a little below the centrum ovale of Vieussens, so that the lateral ventricles are exposed, you at once see that the tumour is somewhat rounded in shape, that it involves the whole thickness of the hemisphere, and encroaches to some extent upon the optic thalamus and corpus striatum, which are also displaced inwards, so that they obliterate the third ventricle, and are in immediate contiguity with the corresponding ganglia of the opposite side. In its centre the tumour is firm and resilient; towards its margins, however—and this is particularly the case as regards its inner and deeper margins—it is softened and broken down. Its substance is of a pinkish-white colour, and is variegated by patches of yellowish translucent glue-like matter, by dark red blotches and stains, and by a few small irregular lacunæ or cavities and open mouths of vessels. When the section is scraped, a creamy juice is collected on the scalpel—and this is especially abundant towards its outer boundaries. The left ventricle has been greatly diminished in size by the growth of the tumour, and the right has undergone a proportional dilatation, its anterior and middle horns being singularly capacious.

Beside the brain lie two lungs, and to these I must next direct your attention. Taking the right first, you notice that it is covered externally by a layer of dense fibrous tissue, the remains of some former pleurisy, by which it was firmly fastened to the thoracic wall. At its apex there is a nodule about the size of a walnut, of stony hardness, and of a greenish-black colour; and below this there is a mass of matter, of a dirty-white colour, about the size of a hen's egg; this is of rather irregular shape, and is not of uniform density. The outer portion is of cartilaginous consistence, and creaks beneath the knife, but its core is soft and disintegrated. It is not defined nor sharply demarcated from the pulmonary tissue, which is somewhat hard, consolidated, and dark coloured, wherever they come into contact. Turning to the left lung, you find that it has also an external fibrous envelope, and that at its apex there is a white calcareous nodule about the size of a bean, around which the lung-substance for the space of half an inch is black and hard. The bronchial glands connected with both lungs are enlarged, black, and of stony hardness—in these respects exactly resembling the mesenteric and the mesocolic glands, which are also submitted to your inspection.

Now, this brain, these lungs, and these glands, have been taken from the body of a male patient who died recently in this asylum. They present to you a series of pathological changes easily recognised and named. It is clear that we have here a case of malignant disease to deal with, and that the cerebral tumour, upon which I desire chiefly to fix your

attention, is really a medullary growth. That seems evident at a glance ; but in order to remove all doubt on the matter, as well as to familiarise you with the histology of such morbid products, I have asked my colleague, Dr. Herbert Major, to examine it microscopically, and to prepare some slides illustrating its structure and formative elements. Dr. Major has handed to me the following interesting report, which you will be able to verify for yourselves, from the sections which he has made and mounted.

"Cells", he says, "constitute almost the entire mass of the tumour, and present a great variety in form and size, and in the number of their nuclei. On viewing a section stained by carmine under a low power, it is found that the cells are not stained uniformly ; in some parts they are deeply tinted and well defined, and in others but little coloured and clouded in appearance. The most common forms, whether of the larger or smaller cells, approach the oval, and but few are distinctly angular or irregular. Those of largest size are seen in many places to be distinctly endogenous, containing so-called daughter and granddaughter cells, with their nuclei and nucleoli. Next to these come simple cells, for the most part oval in shape, having well marked walls, one or more nuclei, and distinct nucleoli. Thirdly, cells are seen, the predominant part of which is the large nucleus, that being surrounded by delicate but slightly stained molecular matter. Fourthly, large oval naked nuclei are visible, containing one or more nucleoli. Now, these elements constitute, collectively, almost the entire tumour, being for the most part closely packed, or separated only by a little amorphous matter, or by delicate fibrous tissue. The masses formed by the deeply stained cell-elements are in most cases irregular, and pass gradually into paler and less definite forms ; but in some places these groups are sharp and distinct, being encircled by a ring of fibrous tissue. In some instances, also, several of these smaller groups occur together, each surrounded by a ring of fibrous tissue, which in its turn is derived from a common band traversing the tumour, and hence an appearance not unlike bunches of grapes on a common stalk. The amount of fibrous tissue entering into the formation of the tumour is exceedingly small : it occurs here and there, supporting or surrounding the groups of cancer-cells, but does not form a prominent element in the deep substance of the tumour. Towards the surface, however, in most directions, it is more distinct, the tumour being to some extent surrounded by transformed brain-substance. It is pale, almost homogeneous, and but slightly susceptible to the action of carmine, and exhibits here and there a few nuclei. It sends down delicate septa, subdividing the tumour ; and these in turn form the supports or boundaries, as the case may be, of the small groups of cells. But this fibrous stroma is not itself free from the cancerous element, for here and there small groups of cancer-cells are seen, as it were, encysted in it ; and these cells are large, well defined, and deeply stained by carmine. Everything points to the conclusion that these are young and vigorous cells ; they are embedded in the fibrous stroma, because they are forming new centres of growth ; the groups are small, because they are young ; the cells themselves are large, and are deeply stained with carmine, because they are of recent development.

"On the other hand, the cloudy cells above alluded to are obviously the products of a retrograde metamorphosis. As seen by the naked eye, the tumour presents, in various parts, a transparent jelly-like appearance, which is clearly due to gelatinous degeneration of the proper cancer-elements, and it would therefore seem that the cloudy condition of the cells is the first step towards this degeneration. Where the tumour approaches the outer surface of the hemisphere, the cortical layers are thinner and atrophied, and are found on microscopical examination to contain degenerated nerve-cells, hypertrophied fibrous elements, with a few true cancer-cells. Nerve-tubules and their axis-cylinders are nowhere discernible in the tumour. The blood-vessels in the tumour are of large size, but not numerous, and are surrounded by a great number of minute corpuscles."

Here, then, gentlemen, we have an unmistakable instance of cancer of the brain, a rare but interesting disease, the morbid anatomy of which you are not likely to forget after an inspection of this striking specimen, and of Dr. Major's highly illustrative preparations. But let us turn back from its morbid anatomy to its symptoms, and inquire how this terrible hidden growth outwardly betrayed itself during the life of the man whose days it cut short. He was a patient in ward No. 2, was named Michael B., and was admitted into the asylum on the 17th of July last, being returned as sixty-six years of age, and a stone-dresser by trade. His son-in-law, who brought him to the asylum, assured us that he came of a perfectly healthy stock, insanity or nervous diseases of any kind having been unknown in his family, and that he had always been steady and sober in his habits, and had never suffered from illness of any kind until about twelve months before, when a short cough began to harass him. This, however, was almost disre-

garded, and his general health remained apparently unimpaired, until the beginning of May, when, without warning, he was one night suddenly prostrated by a stroke which temporarily deprived him of power in his right arm and of vision in his right eye, and which was followed during the night by five or six seizures, which seem to have been convulsive in character. Within a few days after the stroke, strength and usefulness returned to the arm and the eye, but from that time a distinct change was observable in the patient's mental condition. He was at first listless and indisposed for any exertion, or even to leave his bed ; after that he was dull and stupid, and then, in the middle of June, six weeks after the stroke, he became agitated, and was greatly and unceasingly disturbed as to the safety of his soul. Moved by his fears on this account, he would wander about the house during the night, wringing his hands, and would even talk to his relatives about the desire which he felt to put a period to his earthly misery. When brought here, he was found to be a man of average height, fairly nourished, with brown hair, blue-grey eyes, and a florid complexion, due to dilated malar capillaries. He was depressed in spirits, and felt, he said, as if he was being perpetually upbraided by his conscience for having neglected to seek salvation. He was also enfeebled in intellect, as evidenced, not by any loss of memory—which was vigorous, especially as regarded remote events—but in slowness in fully apprehending what was said to him ; and in difficulty in collecting his ideas, so as to shape an appropriate answer. Ultimately an appropriate answer was found, and given forth, but he had to grope about for it, and make a severe effort to reach it. The expression of his face was that of mingled pain and obtuseness, and his manner betokened the alternation of emotional poignancy with intellectual bluntness. Now he was restless, sighing, and weeping, and again he was still and stolid, taking little or no interest in what was going on around him. He complained of intense pain in the left side of his head and chest, and of giddiness. His pupils were equal, and the irides were active ; there was no ptosis, but the mouth was slightly drawn to the left side, and the tongue, when protruded, pointed to the right. All the muscles were tremulous, but this tremor was decidedly more marked on the left side, whereas muscular weakness was most marked on the right. The heart's impulse was feeble, and the first sound was somewhat soft and muffled at the base. The pulse was eighty-six, and irregular. In the end of July it was noted that Michael B. had become more melancholic and more demented. When spoken to, he would, in attempting to reply, dribble into an incontinent emotional overflow of tears. During the first week of August, it was clear that an insidious form of paralysis was advancing upon him. Muscular power and sensibility on the right side of his body were gradually diminished ; the edges of the right pupil became uneven, and the pointing of the tongue to the right, when protruded, grew more and more apparent. The pain in the head was still severe. On the 8th of August, the power on the right side was altogether lost, and that of the left was seriously compromised, while articulation had become drawing and laborious. On the 15th of August he was transferred to the infirmary ward, being in a helpless and fatuous state, dirty in his habits, and incapable of understanding what was said to him, or of speaking. On the 24th of August, he was in a semi-unconscious state, and could not feed himself. On the 2nd of September, he had difficulty in swallowing, and remained constantly in a half-sleeping condition, from which he could be roused into a state of stupid bewilderment by powerful stimulation. On the 6th of September, he was so weak that he required to be propped up in his chair, and his breathing was then stertorous. On the 8th, he passed into a state of profound coma, from which he never rallied, dying on the 10th, at 4 P.M.

I have dwelt at great length, but not, I hope, with useless prolixity, on this one case. I have been anxious to lay before you its whole history, because that history conforms closely to the best descriptions of that disease, of which the particular case passed under review is an example, and because I believe that a typical instance is more instructive to begin with than an abstract definition. Having now before us a pattern, as it were, of cerebral cancer, we are in a position to examine with profit more generally into the origin and nature of the malady. And, first, as to its origin. That, I must tell you, is wrapped in the same obscurity which surrounds the origin of all cancerous affections. A hereditary tendency to it is handed down from parents to offspring ; but how this tendency passes over into the actual morbid condition, or why the brain is selected as the site of the growth in one case, and the stomach in another, we are altogether ignorant. No degree of vigour, or infirmity of cerebral structure, determines this selection ; for congenital imbeciles, and men of great capacity, have alike died of carcinoma of the brain. When the brain-cancer is primary, as according to statistics it is in about one half of all the cases that occur, there is

no doubt that some condition of irritation or exhaustion secures for the brain the first malignant infiltration; but what that condition is, we cannot say. Grissolle believed that cerebral cancer preferentially attacks old people, with brains past their meridian, and on the decline; but that generalisation is not borne out by figures. In forty cases of primary cancer of the brain, recorded by Dr. Ogle, the average age was forty-three years; in thirty-six cases recorded by Berthier, it was forty. When the cancer is secondary, its presence in the brain is more readily understood. The enormous supply of blood which the brain receives, must conduce to the deposition of the *materies morbi* in it, and must favour its germination and growth, when it is once deposited. Occasionally, also, it reaches the brain by continuity of tissue, and cancer seems to have a special proclivity to run along nerves. In many instances, medullary cancer has been known to spread from the orbit, by the optic nerve, to the brain. Mr. Soelberg Wells gives such a case, in which he removed the contents of the orbit, for a medullary cancer, and in which the optic nerve appeared healthy on section, but was found to contain, between its inner and outer sheath, small diffused patches of cancer-elements. The man died one year and eight months after the operation, when a large cancerous tumour was found in the middle fossa of the skull. When cancer stretches in this way from one organ to another, its elements insinuate themselves amongst the textures of the organ secondarily affected without definite limits; but when, on the other hand, it seizes upon the brain, not by continuity or contiguity of tissue, but by virtue of a previous development elsewhere, or when it occurs in the brain alone in the organism, then it may either appear as a distinct tumour, spherical or lobulated, or as a diffused mass, nowhere sharply demarcated from the normal structures. In whatever shape, and with whatever boundaries it occurs, it destroys the cerebral tissue by preying upon it, and causing its absorption, or compressing it, while it, at the same time, forms attachments to, or perforates any membranes that may be in its vicinity. It presents itself as one, or as several tumours, connected, or distinct from each other. In an interesting case, published by Dr. Manning, there were two tumours, one of the size of a walnut, in the convexity of the hemisphere, and not extending into the white substance; and another, of the size of an orange, occupying the middle of the hemisphere; while in three cases reported by Dr. Chapman, there were several tumours, varying in size from a pea to a walnut, dotted over the cineritious substance of the cerebrum. Then the tumours may vary in dimensions, position, and kind, as much as in number. Occasionally, a whole lobe of the brain is implicated, and again, the adventitious growth is no larger than a pea. Any part of the encephalon may be the site of a cancerous tumour, but the hemispheres suffer most frequently, and in these the largest tumours are always seen; for, as Lebert has pointed out, with great justice, a tumour at the base of the brain, and especially near the pons Varolii, or medulla oblongata, is likely to cause death before it has attained any great size, whereas a tumour in the hemispheres may be compatible with life, even when it is of comparatively huge volume. All the different species of cancer are represented in tumours of the brain, except, perhaps, epithelioma, which, though met with on the serous layers of the arachnoid, has never been encountered in the brain itself. By far the most common species, however, is the medullary, the most exquisitely malignant of all malignant growths, which appears as a white, reddish-white, or grey, lobulated and cancellated mass, of soft consistence, and with traces of a fibrous structure, consisting of albumen and phosphorus, holding fat, and yielding a milky or creamy juice. That mass may appear to the eye to be distinctly sundered from surrounding textures, but its intimate union with the neighbouring parenchyma is discovered when any attempt is made to dissect it out. Next in frequency to the medullary is, probably, melanotic cancer of the brain; and, after that, comes schirrus. The melanotic variety is mostly secondary to deposits in other organs. Jane M., who died in this asylum on the 13th of August, 1869, had been operated upon in December, 1868, for the removal of a melanotic tumour, which had become developed on the site of a *nævus* on the outer aspect of the left arm, and which had become intensely painful, and liable to frequent bleeding. At the *post mortem* examination of the body, the axillary glands on the left side, and the inner third of the right clavicle, were found converted into melanotic tumours, of large size, soft consistence, and a deep black colour. Melanotic tumours were also found in the liver, kidneys, suprarenal capsules, and ovaries; and melanotic blotches on the mesentery and pleuræ. On the occiput there was a fluctuating swelling, which, on being cut into, was shown to be composed of clot and fluid blood. Beneath this, the occipital bone was blackened, eroded, and, in some places, eaten through. The bones of the skull generally were of a dark tinge, and presented several distinct melanotic patches, which were black and very soft. Beneath all these patches the *dura mater* was blackened. The occipital lobes of the brain were really melanotic

tumours, large, flattened, softened, and everywhere of a black or brown colour. The melanosis was decidedly most marked on the left side. On the upper surface of the right lobe of the cerebellum there was a single melanotic spot.

[To be concluded.]

ON THE CLAIMS OF SICK AND WOUNDED MERCHANT SEAMEN.

By WM. R. E. SMART, M.D., C.B.,
Inspector-General of Hospitals and Fleets.

JUST now, when the Government is likely to be persuaded to undertake an authoritative supervision of the material of the mercantile navy, with a view to prevention of the great sacrifice of lives of seamen through the wreck of unsound vessels, it will not be inopportune to notice what it is possible to effect in the way of their systematic care when sick or hurt.

Our own data on this subject are limited, because we have only one great institution—the *Dreadnought*—devoted to this purpose, and I am not aware that her statistical reports have ever been published. In the United States, the care of mercantile seamen is a duty fully accepted by the Government. The Marine Hospital Service, entirely distinct from the United States navy, was instituted in 1798 by an Act of Congress which exacted a tax of 20 cents, or tenpence a month, from every person employed in the foreign and coasting trades, for the relief and maintenance of sick and disabled seamen in hospitals or elsewhere, as the President of the United States should direct, and provided that the sums thus collected at the various custom-houses should be expended in the district where collected.

The recipients of relief include women employed in vessels as stew-ardesses, etc., and foreign seamen for whom a charge of 3s. a day is made. Of late, it has been found that the general expenses have increased; and to meet that an Act was passed in 1870 raising the tax to 40 cents, or 1s. 8d. per month, reorganising the service, and placing it directly under a supervising surgeon, Dr. Woodworth, by whom there has been issued the *First Annual Report*, up to the end of June, 1872. This is a very creditable official document, reflecting much honour on the department by its mastery of historical details and statistics, as well as by its fearlessness in suggesting reforms of a system that has grown up somewhat wildly from wanting a general medical supervision.

It is noticeable that the United States navy was dependent on the marine hospitals for the treatment of its men, who contributed like merchant seamen to the fund, and received its benefits previously to the year 1811, when navy hospitals were first established. A table gives the aggregate receipts and expenditure between 1798 and 1872, as follows:

Collection from ships	6,733,966 dollars
Appropriations by Congress	4,705,994 "
Receipts, total available	11,439,960 "
Total expenditure	11,241,156 "

For this great expenditure, amounting to two and a-quarter million sterling, there is shown the hospital service of the mercantile marine through 172 years, and of the United States navy through 112 years, forming a striking result on the whole. During the period there have been at various times 32 hospitals, in different ports where most required, but disestablished when the necessity had ceased at the port. The first of these were all on the Atlantic shore; but, as the annexation of the Western States advanced, a call arose for such provision on the banks of the great central rivers that fall into the Gulf of Mexico, and in 1837 an Act was passed authorising a board of medical officers of the army to select and purchase sites for hospitals on the Mississippi and Ohio rivers, and on Lake Erie. Since 1850 many hospitals have been constituted in other localities.

The system followed is to maintain hospitals where most wanted, and elsewhere to provide for the sick in the corporate or private hospitals of the place which are ready to devote a part, or the whole, if needed, to the accommodation of seamen; the expenses being limited to 20 cents, or 10d. a day for medical charges, and 2½ dollars a week for boarding, lodging, nursing and washing, amounting in all to about 16s. 6d. a week, in no instance to extend beyond four months; the regulated charge for foreign seamen being about 21s. 6d. per week. In this way relief was administered, under State supervision, in 1871-2, at 81 different localities, proving the great extent of an organisation to which we have nothing analogous. There are large hospitals, built of stone or brick, and one of cast-iron, on plans to admit of indefinite