THE HOSPITALS OF LONDON. No. II.

BY DR. CORMACK AND DR. SEMPLE, ASSISTED BY NUMEROUS REPORTERS.

THE VITAL STATISTICS OF HOSPITALS.

DR. WEBSTER has recently directed the attention of the profession to this subject, by his paper in this Journal, which appeared in December last ; and various criticisms and suggestions have likewise been elicited by that communication. The commencement of a new department in the LONDON JOURNAL OF MEDICINE, devoted to the "Hospitals of London", is, we may add, bringing into our possession much valuable information on the same subject. In the meantime, we think, the publication of the following letter cannot fail to be of much use in giving a proper direction to the inquiries now making, or about to be made, by ourselves and others, into the vital statistics of the London Hospitals. We thank Dr. Rees for permission to print his valuable communication.

LETTER TO DRS. CORMACK AND SEMPLE, from G. OWEN REES, M.D., F.R.S.,
*Fellow of the Royal College of Physicians, Assistant Physician to, and
Lecturer on Materia Medica at, Guy's Hospital.*

GENTLEMEN,—The subject of mortality in Hospitals, which has of late attracted the notice of the profession, will naturally occupy your attention. I am therefore anxious to bring before you a plan of return, which, were it generally adopted, would at once shew the fact of increased mortality in any particular hospital or hospitals, with a degree of accuracy such as I am not aware has yet been attempted. I cannot refrain from expressing regret that, while careful analysis of statistical returns supplies us with most valuable knowledge, it is still, unfortunately, too evident that this analysis is, even in the present day, occasionally neglected ; and that returns, in themselves correct, are made instrumental to fallacious reasoning, and the promulgation of the grossest errors.

It will be well, perhaps, here to enumerate, in the first place, some of the causes for variation, which must affect hospital statistics, and invalidate returns referring to the total deaths per annum, in so far, at least, as they may be used *in comparing the mortality of one Hospital with another.*

1st. The mortality among physicians' cases is greater than among surgical cases ; and hospitals do not contain the same proportions of these two classes of patients.

2ndly. The mortality among ophthalmic cases is scarcely any ; and some of our General Hospitals (Guy's more especially) have always a certain number of ophthalmic cases in the wards.

3rdly. The mortality among obstetric cases may be regarded as probably less than that of medical cases generally ; and hospitals contain this class of patients in varying proportion.

If the above statements be admitted, we ought then to place the deaths, medical, surgical, obstetric, and ophthalmic, in different categories.

Even with this arrangement, however, the number of deaths occurring during a year in each institution, and under each head, will shew us but little, if we place the *number of beds* devoted to each subject side by side with the mortality for each hospital, and for the following reason. The number of patients passing through different hospitals in any given time, bears no relation to the number of beds contained in each,—hospitals in which the *accommodation is equal* passing very different numbers of patients through their beds during the year. This difference is so marked, that in one case the excess, I know, amounted to more than one-third of the whole number passing through the hospital, the population of which had been the most stable.

In the table I append, you will perceive that this evil is obviated, by taking the number of patients under each heading passing through the hospitals during a year, and comparing the number with the total mortality for the same period. The derived column headed "Deaths per cent." will then give the correct comparison at a glance.

The mortality among children in General Hospitals may, I think, be safely taken at about the same as that among physicians' cases generally. Their number is not great in such institutions. It may also be well to mention, that patients will sometimes leave hospitals immediately before death, in order to die at home, either at their own desire or that of their friends. This, I believe, is not a very material point, so far as comparison is concerned, as it probably affects hospitals about equally upon the number of patients passing through them during the year. It would appear of the very greatest importance, to detect the difference in the mortality of hospitals. With correct information on this point, we can scarcely fail, not only eventually to detect the causes of evil, but we may perhaps also gain a knowledge of the *more specific influences* exercised by these causes, as they shew themselves in the various localities of the metropolis. I append the table which I would propose for these hospital returns, and have the honour to be,

Sirs, very obediently yours,

G. OWEN REES.

10, *Cork-street, Burlington-gardens,*
January 20th, 1851.

Name of Hospital.	Medical Cases.			Surgical Cases.			Obstetric Cases.			Ophthalmic Cases.		
	No. of cases in the year.	Actual Deaths.	Deaths per cent.	No. of cases in the year.	Actual Deaths.	Deaths per cent.	No. of cases in the year.	Actual Deaths.	Deaths per cent.	No. of cases in the year.	Actual Deaths.	Deaths per cent.

GUY'S HOSPITAL.

The following is the Medical Staff at Guy's ; with the date of each officer's election.

CONSULTING PHYSICIAN. Dr. Bright, *elected 1824.*

PHYSICIANS. Dr. Addison, *elected 1824* ; Dr. Babington, *elected 1838* ; Dr. Barlow, *elected 1840.*

ASSISTANT PHYSICIANS. Dr. Hughes, *elected 1840* ; Dr. Rees, *elected 1843* ; Dr. Golding Bird, *elected 1843.*

SURGEONS. Bransby B. Cooper, Esq., *elected 1825* ; Edward Cock, Esq., *elected 1838* ; John Hilton, Esq., *elected 1845.*

ASSISTANT SURGEONS. John Birkett, Esq., *elected 1849* ; Alfred Poland, Esq., *elected 1849.*

OBSTETRIC PHYSICIANS. Dr. Lever, *elected 1844* ; Dr. Oldham, *elected 1845.*

SURGEON OF THE EYE INFIRMARY. John T. France, Esq., *elected 1849.*

PHYSICIAN TO THE LUNATIC WARD. Dr. Gull, *elected 1847.*

RESIDENT MEDICAL OFFICER. James Stocker, Esq., *elected 1834.*

Last month we gave a short account of the plan of clinical instruction in Guy's Hospital. We now subjoin some details of the general *matériel* of the school,—viz., its Museums, Library, Dissecting-room, etc.

THE MUSEUMS OF HUMAN AND COMPARATIVE ANATOMY are on a scale which entitles them to rank among the first of our national collections. The late treasurer, Mr. Harrison, under whose auspices they arose, and have reached their present large development, has conferred a lasting obligation on our profession by the munificent manner in which he carried out his designs for the advancement of medical education; and we may venture to say that, in the means of teaching, Guy's Hospital School is not second to any institution in this country. The present treasurer, Mr. Dobrée, has, since he has been at the head of affairs, done much towards the furtherance of the labours of his predecessor, by affording a more commodious building for the Comparative Museum, and by the erection of a new Dissecting-room.

The *Museum of Human Anatomy* is divided into an anatomical and a pathological department; both of which are replete with numerous and illustrative examples, under the several subordinate divisions.

The anatomical department contains nearly two thousand different preparations of the organs and tissues. The principal contributors have been Dr. Hodgkin (who laboured at it for many years, and to whose talent and industry it is much indebted), Sir Astley Cooper, Mr. Key, Mr. Cock, and Mr. Hilton; and, for the female organs of generation, Dr. Oldham.

This division of the museum deserves especial mention, from its containing a series of models of the different regions and organs, which stand unrivalled as works of art, and present one of the most complete and most minute representations of the body in existence. They have been executed within the walls of the institution, by Mr. Towne, from dissections made by Mr. Hilton, the lecturer on anatomy, who has been assisted during the last three years by Mr. Callaway. We would premise our remarks upon them by observing, that their intention is not to supersede the necessity for dissection by the student himself, as some have misapprehended. Nor indeed have they that effect; but amongst other advantages which they possess, such as presenting at a view the ordinary relation of parts, etc., many of them are from dissections more elaborate than the general skill of a student could enable him to produce, during the usual period of his studies; and others represent complex relations of parts, which could not be arrived at without many separate dissections, and a knowledge of which the student could not in many instances obtain without this assistance from art. Although their great beauty and delicacy of finish may be appreciated by the uninstructed, yet they can be adequately prized only by the anatomist, who sees in them an actual representation of all that his utmost perseverance could effect upon the recent tissues. It is but due to the talent which is here shewn, to draw attention to this distinction, particularly as their general merit as works of art is apt to cause their intrinsic and essential worth, namely, their truthfulness, to be overlooked.

The illustrations of the anatomy of the brain deserve especial praise. Of these there are thirty, exhibiting different sections of the organ in all its details. There are also thirty-nine, shewing its development from the earliest foetal conditions, and a unique series of the convolutions in the principal varieties of the human race. The organs of sense have also been fully illustrated, especially the ear, the complex parts of which have been developed with exquisite skill, the relative proportions being maintained, and even the character of the textures preserved. The entire distribution of the nervous system is shewn; and we may refer to the model shewing the branches of the fifth nerve and its connexions, as a master-piece, both of dissection and of modelling. To give a description of the whole would be to write an entire work on anatomy, for the nervous, muscular, circulatory, and absorbent systems have been each fully displayed.

The pathological department is divided into twelve sections. It contains four thousand eight hundred specimens, with two thousand drawings, representing the appearances in the recent structures. The drawings are arranged in a cabinet, so as to correspond to the different sections, which are as follows. I. Diseases of bone. II. Joints, ligaments, tendons, etc. III. Vascular system : Heart, arteries and absorbents. IV. Nervous system : Skin. V. Respiratory organs. VI. Digestive organs : Liver, spleen. VII. Urinary organs : Calculi. VIII. Female generative organs. IX. Male generative organs. X. Peritoneum. XI. Utero-gestation, malformations. XII. Parasites. In each section the specimens are arranged under—1st. Deficiency ; 2nd. Excess ; 3rd. Form ; 4th. Disordered nutrition, common inflammation, etc. ; 5th. Scrofula ; 6th. Malignant disease ; 7th. Parasites ; 8th. Injury.

The contributors have been numerous ; among the principal we may name Dr. Hodgkin, Sir A. Cooper, Mr. Key, Dr. Bright, Dr. Addison, Mr. King, and Mr. Bransby Cooper. The latter has recently made a valuable addition to the calculi, and rendered them more readily available to the student, by appending sketches to the section of each stone, so that the eye is at once directed to the different layers it contains. There are in all two hundred and seventy-eight specimens ; and with each there is given a chemical analysis, made by Dr. Golding Bird or Dr. G. O. Rees, and, of late, by Mr. Cooper himself.

This department has also been greatly enriched by a numerous series of models of diseases of the skin, which may with propriety be termed *clinical illustrations*. They form a valuable and unique contribution to this division of pathology. Amongst them are many rare, and some hitherto undescribed, forms of disease. They have been selected and classified by Dr. Addison, whose attention has been directed to this object, as opportunity afforded, during the last quarter of a century, and whose labours herein have proved him a worthy successor of Willan and Bateman, whose pupil he formerly was. They have been executed by Mr. Towne, who has here, as elsewhere, mastered the difficulties of his subject, and given a result which is truly wonderful.

Besides the preparations and drawings above named, there are 1,300 diagrams (or rather enlarged drawings), for the use of the lecturers on anatomy and physiology, surgery, and midwifery ; and 660 for comparative anatomy. There are also 330 pathological casts in plaster, shewing various deformities, dislocations, herniæ, etc.

The *Museum of Comparative Anatomy* occupies the left wing of the museum. It contains 2,550 specimens. The ground floor is principally occupied by skeletons, arranged in the Cuvierian order, from man downwards. The series is very complete, and contains many rare and valuable examples. In the galleries, the preparations of the normal organs are disposed in physiological sections, each of which is well illustrated : for example, of the nervous system there are nearly sixty dissections from the principal classes. The chief contributors have been Sir A. Cooper, Mr. Thomas Bell, Mr. Morgan, Mr. King, and the present lecturer on physiology, Dr. Gull.

THE MUSEUM OF MATERIA MEDICA contains specimens of all the drugs and preparations in general use, under the different forms in which they are ordinarily met with in commerce, together with the principal adulterations. Dr. G. Bird has added a collection of the more rare *proximate principles*, which have a special interest in connexion with the recent advances in the chemistry of animal fluids. Although this department is not, from want of space, so commodiously arranged as might seem desirable, its usefulness for all practical purposes is proved by the fact, that the pupils from this school have, since 1842, obtained five exhibitions, and eight gold medals, at the University of London, on this subject. A plan for the construction of a laboratory for *practical* chemistry is under consideration, and will be carried into effect, so soon as a convenient spot for its erection can be determined upon.

THE LIBRARY contains 3,224 volumes. It is supplied with three weekly, six monthly, and five quarterly journals of medicine, natural history, and philosophy; among which are the LONDON JOURNAL OF MEDICINE, also the *Archives Générales de Médecine*, *Annales des Sciences Médicales*, *Müller's Archiv*, *The Philosophical and Linnean Transactions*, *Taylor's Scientific Memoirs*, etc. etc. It is open to students daily, from nine to five, without additional fees. As during the day there is but little leisure for reading, each student is permitted to take home one volume, which must be returned by ten o'clock the following morning, under penalty of a small fine, or loss of privilege for a week. It is the duty of the librarian to register the names of those who avail themselves of this privilege, together with the books taken.

THE DISSECTING ROOM is of recent construction, and has many arrangements deserving notice. The dimensions are—length forty-six feet, breadth twenty-four feet six inches, and height twenty-four feet. The ceiling is vaulted. It is lighted by a lantern, or sky-light, thirty feet by twelve feet, glazed with large sheets of rolled plate glass. The floor is of asphalt, which has the advantage of warmth, and does not imbibe moisture. The walls are lined to the height of seven feet with slabs of slate, which are for the delineation of extemporaneous diagrams. It is ventilated by twenty grated openings, ten near the floor, and ten in the ceiling, communicating with a main shaft at some distance from the building. The result is very satisfactory; for though no means are used for disinfection, the air is kept at all times pure. There is a large private room adjoining, for the demonstrators to receive their classes in, when demonstrating the different organs; and the washing-rooms, etc., for the convenience of students, are all that could be desired. We would recommend the dissecting-room at Guy's as a model for similar buildings.

LOCK HOSPITAL.

The following are the names of the gentlemen composing the Medical Staff of the Lock Hospital, with the dates of their election.

CONSULTING PHYSICIAN. Dr. Sayer, *elected in 1847*.

SURGEONS. E. Cutler, Esq. and Samuel Lane, Esq., *elected respectively in 1840 and 1848*.

ASSISTANT-SURGEON. Henry Lee, Esq., *elected in 1848*.

The LOCK HOSPITAL, Harrow Road; the Chapel and Asylum, Westbourne Green, are thus briefly described by Mr. Peter Cunningham, in his *Handbook of London, Past and Present* (edition 1850, p. 295): "Supposed to be called 'Lock' from the French *loques*, rags; from the rags (lint) applied to wounds and sores; so *lock* of wool, *lock* of hair. The hospital (the only one of the kind in London) was established in 1746, for the cure of females suffering from disorders contracted by a vicious course of life; the Chapel, in 1764, as a means of income to the hospital; and the Asylum in 1787, for the reception of penitent females recovered in the hospital. A subscription of three guineas annually entitles to one recommendation: 50*l.* as a donation, or 5*l.* 5*s.* annually, constitutes a governor. The Loke, or Lock, in Kent Street, Southwark (from which the present hospital derives its name), was a lazaret-house, or 'spital for leprous people, from a very early period. There was a second betwixt Mile End and Stratford-le-Bow; a third at Kingsland, betwixt Shoreditch and Stoke Newington; and a fourth at Knightsbridge, near Hyde Park Corner. In one of these Locks, Bully Dawson died in 1699, aged 43. St. Giles'-in-the-Fields and St. James' Hospital in Westminster (now the Palace), were both instituted for the reception of lepers."

When the hospital was founded, in 1746, it occupied a building in Grosvenor-place. The lease having expired in 1842; and the ground being required for other purposes, it was removed to its present site. In the centenary report, printed in 1846, the following summary is given of the statistics of the institution. In perusing this table it is important to bear in mind "that no person is re-admitted, on any recommendation whatever, who has been discharged for irregularity, or has again received the infection"; and

we are likewise informed in the centenary report, that "the house is almost always full, and that it is often necessary to postpone proper objects for want of room."

Patients cured—From January 1747, to 25th March 1845 ...	55,220
In-Patients cured—25th March 1845. to 25th March 1846 ...	312
Out-Patients cured	170
Eloped.....Ditto.....	35
Discharged for ill-behaviour.....Ditto.....	16
Died.....Ditto.....	1
In-Patients—25th March 1846.....	42
Out-Patients—Ditto	43
	619

Total..... 55,849

In the report for 1850, it is stated that since the foundation of the hospital, 58,514 patients have been admitted and cured, and that during 1850, the number admitted and cured was 885.

We are astonished to observe the small amount of money which is collected. It is not only desirable that the miserable women who, sometimes from choice, but more frequently from necessity and to avoid starvation, are driven to prostitution, should have medical aid; but it is also most important, for the sake of the virtuous poor who go to general hospitals, that they should be kept separate, and afforded religious instruction and advice when under treatment. The following is the

Statement of Income and Expenditure for 1850.

DR.	£. s. d.	CR.	£. s. d.
To Balance 31st Dec. 1849 -	34 13 9½	By Outstanding Debts of 1848	
Subscriptions - - - -	611 7 9	and 1849 paid off - -	885 13 0
Donations - - - -	432 16 3	Loan Ditto - -	200 0 0
Legacy - - - -	100 0 0	Tradesmen's Bills 1850, <i>pt</i>	400 2 2
Sermons in Lock Chapel,		Coals, Gas, etc. - -	121 12 0
and Chapel Boxes - -	161 1 9	Drugs (<i>part</i>) - - -	39 19 0
Amount received by "spe-		Expenses of Management	256 11 1
cial effort" of the Hon.		Incidental Expenses - -	84 6 7½
A. KINNAIRD - - - -	624 9 9	In Treasurer's hand - -	6 2 2
	1994 9 3½		1994 9 3½

Liabilities outstanding 31st December 1850, about £680.

The present beautiful edifice was commenced in 1841. In April the necessary excavations commenced; and on the 29th of May, in the same year, his Royal Highness the late Duke of Cambridge—an efficient friend of this and other metropolitan charities—laid the foundation-stone, in presence of a large and distinguished assembly. The hospital furnishes accommodation for fifty male and fifty female patients. Some idea of the enormous expense which attends the erection and furnishing of a London hospital is afforded by the following account, which we extract from the third Report of the Building Committee, of date June 4th, 1842.

RECEIPTS.	£	EXPENDITURE.	£
Subscriptions - - - -	8,826	Purchase of Land - - - -	4,790
Collection after a Sermon at Tri-		New Building - - - -	7,462
nity Chapel, Conduit-street, by		Laying out Ground - - - -	205
the Rev. H. H. Beamish - -	49	Furniture and Fixtures - - -	600
£1000 reduced three per cent.		Incidental Expenses - - - -	500
annuities at 90 - - - -	3,600		
	£12,475		
Deficiency to be supplied - -	1,032		
	£13,557		£13,557

Deficiency - - - -	£1,082
Estimate—Wings - - -	£5,000
Chapel - - - -	4,000
	<hr/> 9,000
	<hr/> £10,082

THE ASYLUM was founded in 1787, in connexion with the old Lock Hospital, by the Rev. Thomas Scott, the pious and well known Bible commentator. In 1842 it was removed to its present site ; and in 1848-49 was enlarged to its present dimensions. When first founded, the asylum received only 16 inmates ; in 1842 it was enlarged, so as to receive 20 ; and now it is capable of containing 100. Since the foundation of the asylum, 1175 female patients of the hospital have been admitted—a majority of whom have been provided with situations, restored to their friends, or otherwise comfortably settled in life. At present there are generally about 45 in the asylum.

The accounts of the asylum are kept distinct from those of the hospital. The following is the official

Statement of Income and Expenditure for 1850.

DR.	£.	s.	d.	CR.	£.	s.	d.
To Balance 31st Dec. 1849	155	0	3	By Outstanding Building			
Subscriptions - - -	185	13	3	Debts of 1849 paid off	553	11	2
Donations - - - -	238	11	3	Tradesmen's Bills - -	362	19	9½
Sermons in Chapel, and				Coals, Gas, etc. - - -	84	14	3
Chapel Boxes - - -	172	12	11	Expenses of Manage-			
Amount received for				ment - - - - -	128	1	4
Work by Inmates - -	383	11	6	Incidental Expenses -	52	7	6½
Interest on Stock - -	5	17	10	Balance in Treasurer's			
Legacy - - - - -	50	0	0	hands - - - - -	0	12	11
	<hr/> 1191	<hr/> 7	<hr/> 0		<hr/> 1191	<hr/> 7	<hr/> 0

Liabilities outstanding 31st December 1850, about £175.

A system of registration has been adopted at the Lock, which, if properly carried out, may afford much valuable information. The object of this system is to present in a condensed form the aggregate result of the cases received during the year. When each case is only taken in a separate form, the knowledge to be derived generally lies buried under a mass of unattractive detail, which few have either the time or the patience to wade through. But when the principal features of the cases are extracted and arranged in a tabular form, general results are strikingly displayed, and easily understood. We sincerely wish that the plan which has thus been commenced at the Lock hospital may in future years be carried out fully and accurately ; and we cannot help thinking that the same, or a somewhat similar system, might with advantage be adopted at other hospitals, and with reference to other diseases than the venereal. The inspection of the register, to which we have been kindly afforded access, while it shews that with a very little trouble much more might be accomplished than has hitherto been done, contributes valuable information.

Out of fifty-five cases of secondary syphilitic eruption, forty-six had never taken mercury properly for the primary disease. The history of the remaining nine cases is not given. In the forty-six cases, the previous treatment of which is recorded, we find that twenty-two had taken no mercury ; fifteen had taken it for a short period only ; and three had used it irregularly. In the remaining six cases, the effect of the mercury was either very slight, or excessive.

It is a very remarkable fact (already noticed in the LONDON JOURNAL OF MEDICINE, vol. for 1849, p. 801), how very seldom it happens that cases of secondary syphilis present themselves at our London hospitals, where a properly regulated and sustained course of mercury has been employed in the treatment

of the primary disease. In almost all the cases in which that medicine has been used, and secondary symptoms have followed, it becomes very easy to point out the circumstances in the treatment which have prevented its legitimate action upon the system. When used without proper care, and without its effect upon the system being properly regulated and controlled, it not only fails to cure the disease, but actually leaves the patient in a worse state than if he had taken no medicine at all. The statistics which we have been able to collect upon this subject undoubtedly shew that a worse class of symptoms follow an ill-regulated course of mercury than where the disease is left to be combated by the unaided powers of the constitution. It may therefore become a serious question with those who are unwilling or unable to devote the requisite time and attention to a mercurial course, whether they had not better abstain from the use of mercurials altogether. But, on the other hand, where the remedy has been administered with due care and attention, the testimony we have appears greatly in its favour. Our tables of secondary disease show a comparative absence of cases in which a mild but sustained course of mercury has been used for the primary affection; and we therefore conclude that did circumstances permit, mercury might be so used in the treatment of this disease, as to reduce the number of those in whom any subsequent symptoms occur, to a few exceptional cases.

REPORTS OF SOCIETIES.

ROYAL MEDICAL AND CHIRURGICAL SOCIETY.

TUESDAY, JANUARY 14, 1851.

SAMUEL SOLLY, ESQ., VICE-PRESIDENT, IN THE CHAIR.

LARGE FIBROUS TUMOUR OF UTERUS. By R. R. ROBINSON, ESQ. A tradesman's wife, aged 40, pregnant with her third child, four days before her confinement, slipped down four stairs, without feeling any inconvenience, and on the same day caught her foot against a chair, from which she felt pain in her left hip, which recurred at times subsequently. She was confined at four o'clock in the afternoon; the labour was in every respect natural. The placenta was thrown off by uterine effort in a short time; the uterus contracted well, and there was no hæmorrhage. About two hours afterwards, she was seized with cold chills, and, upon being put to bed, was sick and faint. Mr. Robinson saw her five hours and a half after her confinement, and found her in a state of complete collapse. Fearing there was internal uterine hæmorrhage, and not feeling certain about the state of the uterus, he introduced his hand, and found that organ flaccid, but free from blood. By cold and pressure, and by keeping the hand some little time in the uterus, contraction of a feeble kind was produced, and also a somewhat improved condition of the system generally. She rallied a little, but never fairly got out of collapse; she lived ten days, and died apparently from atonic peritonitis. Upon dissection, twenty-four hours after death, the intestinal convolutions were of dark colour, being smeared with blood, and were united to each other and to the uterus, by recent and easily-separable adhesions. There were three pints of dark venous blood, without coagula, in the peritonæum. The tumour was covered with peritonæum, an elongation from the uterus, and this, at the angle of reflexion, was lacerated to the extent of two inches. Mr. Robinson was of opinion that the tumour had augmented much during the growth of the uterus, and that, in consequence of being entangled with the intestines, did not move so readily when the uterus contracted, as the uterus, and thus the peritonæum, being put upon the stretch by recurrence of pain, gave way.

CASES OF RUPTURED LIVER, LUNG, ETC. By ATHOL JOHNSON, ESQ. The author related five cases. In four of these, death occurred either directly