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MEDICAL NEWS

Professor V. G. Griffiths is the president of the British Medical Association (Malta Branch) for this year, with Dr. R. L. Cheverton as Vice-President. Mr. J. L. Pace of 50, St. Francis Street, Balzan has once again accepted the duties of honorary Secretary and Treasurer.

The first meeting of the B.M.A. this year, on the 14th January, consisted of a talk by Mr. Joseph Attard, newly returned from England, on "Varicose Veins And Compression Sclerotherapy". This was followed by a film.

On the 28th January, Mr. J. V. Barber-Lomax, one of our new residents, lectured on the "Historical collections of the Wellcome Institute" and also showed a large number of transparencies. Mr. Barber-Lomax, a qualified veterinarian, speaks with authority on "Wellcome" since he had been for many years the veterinary historian and the curator of the surgical instrument collection of the Institute. Moreover, it was through his great interest that the Wellcome foundation donated to our Medical School a fine collection of instruments of historical importance.

These have now been arranged in the bay on the top floor of the Medical School. Mr. Barber-Lomax made the presentation officially to Prof. V. G. Griffiths, deputising for the Dean of the Medical Faculty who was abroad. Our Medical School now has, thanks to "Wellcome" and to Mr. Barber-Lomax, the nucleus of a Museum of Medical History.

At a Branch meeting on the 26th March, a film entitled "Angiologia", produced by the Firm Johann A. Wulfing of Germany was shown.

On the 6th April, Dr. George Watkinson gave an address on "Some aspects of Ulcerative Colitis". At another meeting on the 28th April, Dr. H. J. Barber, formerly a Research Controller for May and Baker, spoke on "The Search for New Drugs — Retrospect and Prospect".

At a meeting on the 3rd May, Mr. Harold Ludman an E.N.T. consultant at the National Hospital, Queen Square and at King's College Hospital, London, spoke on "Neuro-Utology".

Under the auspices of "The Association of Surgeons and Physicians of Malta". Professor John Malins gave the Novo Lecture on "Diabetes Mellitus", on the 27th April.

Professor Peter Curzen, of the Westminster Medical School visited the University between the 6th and the 13th March. He lectured on "The Immunological Puzzle of Pregnancy" on the 8th and on "Clinical Monitoring of the Foetus" on the 10th.

Dr. N. F. C. Gowing of the department of Morbid Anatomy at the Marsden visited the Medical School at the invitation of the university, between the 17th and the 29th April. He lectured on the special pathology of the lymphoreticular system to medical students and took part in a clinico-pathological conference, presenting three cases. As a member of the council of the Royal College of Pathologists he also took the opportunity to meet the members of the college in Malta.

Professor H. Lehmann of Cambridge, the well known authority on the haemoglobins, visited us and spoke on "Human Haemoglobin" on the 26th January.

On the 26th April, professor Diamant, of the University of Umea, Sweden, lectured on "Modern Trends in Ear, Nose and Throat Surgery".

Dr. H. B. Wright, the director of the London medical centre of the Institute of Directors lectured, on the 30th April on "Automated Multiphasic Screening Centre". Since this was in the morning the audience consisted mostly of medical students and at the end we noticed a look compounded of wonder and incredulity on their faces, if our diagnosis was correct.

We congratulate:

Dr. Frank Vella on his appointment as Professor in the Department of Biochemistry at the University of Saskatchewan, in Canada.

Dr. Norman Griscti-Soler ('64) on his being awarded the Degree of Doctor of Philosophy in Medicine by the University of Birmingham.

Dr. George Boffa ('60) on his being elected a Fellow of the Royal College of Surgeons, in the Faculty of Anaesthesia;

Dr. Francis Sammut ('62) on his attainment of the Diploma in Ophthalmology (London) from Moorfields;

Professor Arthur P. Camilleri on his being invited to serve as an external examiner to the Royal College of Obstetrics and Gynaecology.

Dr. Edwin S. Grech ('55) on his election to the Fellowship of the same College;

Mr. Joseph Muscat ('49) on being appointed Senior Surgeon on the Consultant Staff of St. Luke's, with effect from April 1968.

Professor George Camilleri for whom wedding bells rang merrily on the 18th April, when he married Miss Jo Ann Bonnici at St. Ignatius Church in Sliema.

Baron Peter Rotschild M.D. and, a little later, Professor Karl Ransberger lectured on aspects of Cancer research work, in February.

Mr. J.D. Morgan, principal lecturer in charge of City and Guilds Laboratory Technicians Courses at Paddington Technical College, was in Malta for 6 days to study and advise on the possibility of starting such courses locally.

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MEDICINE IN MALTA IN 1800-1810

Contrasts, Concepts and Personalities

PAUL CASSAR

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The British Medical Association (Malta Branch) prize in the medical essay competition for 1969 was awarded to Dr. Paul Cassar for this paper.

The dawn of the 19th century stands out as a turning point in Maltese history —socially, politically, commercially and culturally.

In June 1798 there occurred an overnight change from the centuries-old conservative and feudal government of the Order of St. John of Jerusalem (1530-1798) to the short lived but hectic, liberal and egalitarian regime of the French under Napoleon (1798-1800).

The Maltese masses were deeply shaken as they were totally unprepared for this abrupt and radical transformation of their political, social and religious life which tore asunder their traditional attitudes and beliefs. The reforms introduced by the French, especially those touching the religious tenets of the Maltese, uprooted the pattern of life of the people, rendered the new masters unpopular and provoked the islanders to rise in arms against them. The outcome was two years of war, disease and starvation and an invitation from the Maltese to His Britannic Majesty George III to place the Island under his protection. Thus was ushered in the British period in our history (1800-1964).

When the French finally capitulated in September 1800 and Great Britain took over the civil and military administration of Malta, the Island was in a very poor shape. Its economic life was shattered, with impoverishment of the people. The organisation of the medical services that had evolved during the previous two centuries was disrupted and replaced by makeshift hospital arrangements to meet the demand of the unexpected war crisis. The period of readjustment that followed the end of the hostilities was long drawn out and difficult.

The Royal Commissioner, Sir Charles Cameron, who was charged with the administration of the Island was faced with a daunting task. He was inundated with petitions for financial assistance from private individuals and from public officials to make good the losses they had suffered during the French occupation and to tide them over the hard times of the aftermath of two years of war and destruction.

The plight of medical men

The petitions submitted to Sir Charles Cameron included requests for the granting of gratuities for dependents of deceased government employees; for reinstatement to former medical posts abolished by the French; for appointment to vacant offices and for pensions following retirement from the medical organisation of the Order after many years service — even as long as fifty. There were also requests for increases in stipends due to the rise in the cost of living and for the removal of salary anomalies among the same category of medical men. Complaints

on this score were especially heard from the *medici dei poveri* (literally "doctors for the poor") corresponding to the present District Medical Officers.

Some of these physicians had left the towns at the begining of the revolt against the French and joined the insurgents in the countryside to give their professional services to the poor sick and the men of the Maltese battalions without receiving any salary or any other kind of remuneration *(Ordini e decreti, 1805)*.

A case, representative of the situation at this period, is that of Dr. Angelo Pace who had entered the medical service of the Order of St. John in 1760 as a *medico dei poveri* for Floriana. He later joined the navy as a medical officer, serving on the frigates and the galleys, until he was reappointed *medico dei poveri* for Birgu where he remained for twenty-one years. On the advent of the French in Malta his post was suppressed and Dr. Pace threw in his lot with the insurgents and settled at Mdina where he cared for the orphans received into the Seminary and treated the sick admitted to the emergency hospital set up in the Church of St. Sebastian and its adjoining house at Rabat during the fever epidemic of 1800. In December of this year, on the return of peace, he was reinstated as *medico dei poveri* at Birgu but he was not paid a salary until a year later *(Ordini e decreti, 1805b)*.

Another instance is furnished by the petition of Giuseppe Stivala "first pharmacy assistant" at the Civil Hospital for men at Valletta. "At the opening of the gates" of Valletta. i.e. on the capitulation of the French forces blockaded inside the fortifications of Valletta and the other towns round the Grand Harbour, the hospital pharmacy was completely devoid of drugs and the administrator of the hospital instructed Stivala to supply the pharmacy with the necessary medicaments which he did "with zeal and exactitude" and at his own expense and without receiving any emoluments for his work for five months.

A further plea for payment came from the *bragherista* of the same hospital, Giuseppe Spiteri, who held the licence of *barberotto* (barber-surgeon). The *bragherista* manufactured the hernia trusses under the direction of the Principal Surgeon whom he accompanied in the ward rounds, morning and afternoon. He was always on call for any adjustment needed to the trusses of hospital patients. He was paid six *tari* (one *tari* was equal to about 1½d) for every truss — "as at the time of the old government of the Order" — after the appliance was examined and approved by the Principal Surgeon or his *prattico* (assistant).

At least two medical men suffered a demotion in their careers with the return of peace. One of them was a Dr. Lorenzo Cassar. On the 9th September 1800 he was appointed *medico del palazzo* (Palace Physician) by Sir Alexander Ball in accordance with the usage that had prevailed at the time of the Order of St. John when the Grand Master, who lived at the Palace at Valletta, had his personal physician. On the 19th August 1801, however, Dr. Cassar's post was abolished by H.E. Sir Charles Cameron. The other was the surgeon Antonio Cutajar of Bormla who had been licensed to practise as a physician by the Medical College during the French blockade because all the doctors had left that town to join the insurgents in the countryside. In November 1801 his warrant to practise medicine was withdrawn as in the opinion of the *protomedico* (Chief Government Medical Officer), Luigi Caruana, the three physicians who by then had returned to practise in Bormla were sufficient to meet the needs of the inhabitants *(Ordini e decreti, 1805c)*.

Decline of Hospitals

Frantic appeals for financial help came from the administrators of various hospitals as their bequests and revenues could no longer be counted upon to provide sufficient income for their maintenance.

In September 1801 Dr. Gregorio Bajada, the *economo* (treasurer) of St. John Hospital for men at Gozo, remarked on the financial losses suffered by the hospital and the insufficiency of its funds to meet current expenditure; on the need for the replacement of the beds, planks, linen

and other items of equipment which had been carried away by the French. Money was also required to pay for the medicaments supplied to the hospital by the pharmacist Orazio Aquilina. In short the hospital "had been reduced to such misery that even the issue of the little quantity of wine which is often necessary for the sick has had to be suspended". Dr. Bajada had become so disheartened by these shortages that "a thousand times" he had considered giving up his post because of the difficulties he was encountering in making good the deficiencies of his hospital.

On the 20th July 1802 it was the turn of the Procurator of St. Joseph Hospital at Zebbug, Malta, to complain. During the revolt of the Maltese the hospital "had been obliged to admit and treat all the sick and wounded that were brought to it in great numbers". Mattresses and sheets had been consumed; debts had been contracted for the maintence of the patients and no funds were to hand to replace its equipment.

The jurats of Mdina, who were responsible for the administration of the Hospital of the Holy Spirit at Rabat, Malta, wrote on the 12th February 1802 that at the time of the insurrection so many patients had been received "that even the church was full of beds". All the linen and clothing had been depleted having either been consumed for the use of the patients or been requisitioned by the French troops of Mdina. It was in need of one hundred sheets and pillows, fifty palliasses and twenty-five mattresses, twenty-five "white blankets for summer" and thirty woollen blankets. The hospital had lost "almost all its silverware — including thirty-eight bowls, twelve plates and other utensils" — which had to be disposed of to help finance the war effort. It had to borrow money to buy the medicaments and pay for the maintence of the sick but, what was worse, it had not received any interests on the capital invested with the bank of the Municipality of Valletta. In fact it had been reduced to such straits that it was no longer in a position to admit the usual number of patients. No funds could be obtained from the Municipality of Mdina as this body was burdened with the expense of repairing the road leading to Valletta and the conduits that drained away the waters that would otherwise have accumulated in the valley round Mdina *(Ordini e decreti,* 1805d).

In Valletta the erstwhile Holy Infirmary of the Knights of St. John was turned into a military hospital by the French. Under British rule the Infirmary continued to be used for the treatment and care of sick troops. At first it received sick soldiers from Egypt and from units of the British Army in Italy under Sir James Craig. It was later (1805-8) reduced to a regimental hospital and to a deposit of hospital stores, the rest of the building remaining unused (Domeier, 1810).

On the conversion of the Infirmary into a military hospital, the male civilian patients were transferred to the nearby nunnery and church of Mary Magdalen which came to be known as the Civil Hospital for men. In 1802 this institution and the Women's Hospital, that dated since the seventeenth century, were reorganised and detailed rules and regulations were published for their better running *(Piano per il regolamento dell'Ospedale di Malta,* 1802a).

When Samuel Taylor Coleridge visited the Civil Hospital during his stay in Malta (1804-5) he was struck by the presence of a child of twelve years lying in the same bed with a man of seventy years in the Venereal Wards and also by the great number of holy images hanging on the walls in "every staircase, by every bedside, in every chamber" (Coburn 1962a). A British Army doctor of the time, Dr. William Domeier, is more informative about this hospital which had to cater for a population of 94,000 souls (Malta and Gozo).

The set up of the hospital came under the censure of Domeier who found it ill-adapted as a healing establishment. In accordance with the ideas held by a section of the profession at that time, the windows were kept closed to exclude fresh air in the belief that air was harmful for surgical patients. Thus surgeons had to dress the sick by candle light even

at two o'clock in the afternnon in summer.

The professional staff consisted of four physicians and four surgeons working on a monthly roster. This system had the disadvantage that patients entering the wards in the last days of the month, passed, after a few days, into the care of a different physician who often altered the whole plan of treatment. It also afforded occasion for rivalry among the physicians and surgeons who, we are told, endeavoured "to acquire practice by contradicting and blaming one another and acting otherwise than their colleagues though no better".

The rest of the professional staff consisted of four assistant physicians and four assistant surgeons; an apothecary, a number of dressers and a "person who only bleeds and cups, even one person who carries smelling bottles at the medical visits for fear that anybody might faint away — and really the atmosphere is, in some wards, in such a state that the fear is not ill founded". Conditions in the Women's Hospital were no better.

Commenting on the results of the methods of treatment employed at that time in these establishments, Domeier makes an observation that still holds good today anywhere in the world: "It is a necessary distinction to be made, whether a patient recovers through the remedy he has taken or only during the time he takes a remedy which is not efficacious enough to prevent his recovery. Physicians are often too much honoured as in both cases the recovery is attributed to their skill".

British Naval Medicine

Malta's connexion with the British Crown eventually led to the growth of the Island into one of the most formidable naval bases of the Mediterranean. This development not only determined the political orientation in world affairs and the economic pattern of the Island but also brought Maltese medicine, for the first time in our history, in close touch with British medical thought and practice. At this period this influence was exerted mainly by the medical personnel of the navy.

A naval hospital was established in 1800 in the former Armoury of the Knights of St. John at Birgu in *Strada Dietro il Quartiere.* There is no doubt, however, that seamen of the Royal Navy were also received into the Military General Hospital at Valletta. In fact on the 19th August 1803 sick crew on *H.M.S. Madras,* who were suffering from "infectious or inflammatory fevers" were ordered by Lord Nelson to be admitted to the General Military Hospital by arrangement with Major General Villettes, the Officer Commanding the Troops in Malta.

Nelson felt that if Britain was to keep Malta, the Admiralty had to provide "a proper naval hospital". He again returned to the subject on the 7th November 1803 as he did not wish "to have thrown the trouble of attending our seamen on the medical skill of the Army"; so much so that he sent Dr. John Snipe, Physician to the Fleet, to Malta to inspect Villa Bichi with the view of establishing there a naval hospital. Following Dr. Snipe's visit, Nelson declared on the 20th December 1803 that Bichi was "the fittest situation at Malta for a naval hospital".

In the meantime seamen continued to be treated in the Military Hospital under the Naval Surgeon, Mr John Gray, until they were removed to the erstwhile Slave Prison in *Strada San Cristoforo* (St. Christopher Street), Valletta. The date of the transfer may have been the 1st January 1805 as on this day sick naval personnel ceased to be admitted into the Military Hospital (Nicolas, 1845).

In May 1804 Lord Nelson was again pressing for the acquisition and enlargement of Villa Bichi and its conversion into a naval hospital (Nicolas, 1846) but no steps were taken for many years afterwards; on the contrary, sick seamen were re-transferred across the Grand Harbour to the Armoury at Birgu in 1819.

Dr. J. Hennen, Inspector of Military Hospitals (1821-25), describes the place as being "an airy building... well adapted to its purpose". It was capable of accommodating about one hundred and twenty patients but in an emergency there was enough room for eighty or one hundred or more men. In wartime all its beds

were occupied but in peacetime the number of patients rarely exceeded twenty (Hennen, 1830a).

From 1804 to 1827 the hospital was under the direction of Dr. John Allen R.N., the Principal Medical Officer. He had been appointed surgeon to the Navy in 1784, served under Lord Nelson and was superannuated in 1827. He died in Malta on the 14th January 1849 at ninety-four years of age, and was buried in the Msida Bastion Cemetery.

John Allen was renowned for his treatment of gun shot wounds. It has been said of him that his dexterity "in using his knife was equalled by, what is of equal importance, his knowledge of discerning when not to use it". He also enjoyed a good reputation for his treatment of fevers in which he resorted to the lancet, "that minute instrument of mighty mischief", very sparingly *(Malta Times,* 1849)

Sick seamen of the Royal Navy continued to be cared for at the Birgu Armoury until 1832 when Villa Bichi was finally opened as an *ad hoc* naval hospital (Cassar, 1965a).

Fevers

A survey of the diseases with which naval surgeons of the British Mediterranean Fleet had to deal in the first decade of the nineteenth century reveals that scurvy had become almost unknown among sailors thanks to the "excellent regulations and unceasing care of the Commander-in-Chief in providing liberal supplies of fresh meat, vegetables and lemon juice". Pneumonia and dysentery were endemic but "fever epidemics" constituted the most frequent and most serious conditions that afflicted seamen and civilians alike in the British naval stations of Malta, Gibraltar, Port Mahon (Minorca) and Carthagena.

These fevers appeared especially towards the close of summer (end of June and beginning of July) and during autumn. They were known by the name of the place where they prevailed such as Carthagena or Gibraltar Fever, etc., although the more generic name of Mediterranean Fever was towards the end of the decade supplanting the local nomenclature as a more appropriate appellation.

At a time when the physician lacked the refined diagnostic aids of to-day and had nothing to go by except the subjective complaints of the patient, his skill as an observer and his own personal experience, it is not surprising to find that there were great differences of opinion among medical men with regard to the nature and aetiology of these fevers and the criteria to be followed in their prevention and treatment.

Among the physicians who attempted to elucidate these problems was William Burnett — one of the first of a long line of British naval doctors to work in Malta. He was Physician and Inspector of Hospitals to His Majesty's Fleet in the Mediterranean and Honorary Fellow of the Imperial Medico-Chirurgical Academy of St. Petersburg (Burnett, 1816 a). In May 1810 he was appointed Physician to the Mediterranean Fleet which post he relinquished in October 1813 because of ill health.

His accounts of these fevers abound in clinical histories and reports of *post-mortem* examinations. The medical knowledge of the time, however, was still too meagre to allow him to understand the aetiological factors involved and to differentiate among the various specific pathological conditions masquerading under the common phenomenon of fever and to prescribe a rational method of management and therapy.

Burnett's first encounter with the fevers of Malta occurred in May 1799 when units of the British navy came to the aid of the Maltese to blockade from the sea the French troops that had been penned by the Maltese insurgents inside the fortifications around the Grand Harbour. He was then serving in the *Goliath* when the ships company was attacked by a fever "similar to one then prevalent in the Island". The *Goliath*'s boats had been employed in watering at Marsascala, a small harbour to the south east of Valletta, when on account of a strong wind the boat's crew had to remain ashore all night. A few days later several of the men fell

ill with fever which eventually spread to some forty of the ship's company. The most prominent disturbances were nausea and vomiting, headache, thirst and delirium; in two or three instances the parotid glands suppurated. The ship proceded north to St. Paul's Bay and the sick were landed and placed "in a large castle... where the whole recovered".

In the summer of 1800, Burnett joined the Maltese built ship *Athenian.* While she was being careened and fitted at the Malta Dockyard there were many cases of fever which Burnett was inclined to ascribe to the crew's exposure to the sun; however, "by a proper use of the lancet in the early stages joined to purgation, they all speedily recovered; none died nor was one sent to the hospital during two years" that Burnett was surgeon on that ship which "always continued remarkably healthy".

In October 1810, as Physician to the Mediterranean Fleet, he was sent by the Commander-in-Chief to Sicily and to Malta to examine the state of health of His Majesty's ships and the running of the hospitals ashore. He found that the men of the *Eagle* had been quartered in a barrack while the ship was careening. "They had easy access to spirits and wine", he recorded, "and committed the usual excesses of sailors when on shore. The effects of this were soon visible for about the middle of December a fever made its appearance amongst them and ultimately extended to nearly sixty of her men. The surgeon considered it at first to be purely of a typhoid nature". They were admitted to the naval hospital where they all recovered thanks to the use of early and repeated bleedings, purgation and epigastric blistering.

The frigate *Alceste* and the sloop *Scout* also had many of their men down with fever, involvement of the abdominal viscera and frequent stools but they, too, did well on the same regimen.

In June 1811 it was the turn of the men of the *Pomone* and the *Weazle* to suffer from "the bilious and yellow fever of the Island" characterised by a deep yellow suffusion of the skin, vomiting, pain in the epigastric region, loins and lower limbs. In 1812, between the 1st April and the 23rd May, one hundred and fifty-three men from the *Victorious* and the *Trident* were treated at the naval hospital for fever with eight fatalities.

Burnett has recorded the symtomatology of the then so-called "bilious remittent fever". His account of it is given in such terms as to enable the medical practitioner of to-day to pick out in it most of the clinical features of brucellosis (Report of the Committee... for the Suppression of Mediterranean Fever, 1909). Burnett has the merit, therefore, of being the first investigator to record the clinical picture of brucellosis or undulant fever. As Burnett's book is not now readily available it is worthwhile reproducing his description at length as it is of paramount importance in the history of human brucellosis.

"The patient", writes Burnett, "complains of considerable headache with nausea and prostration of strength; the eyes are somewhat suffused and the countenance a little flushed; the tongue is white and moist with considerable thirst; the skin is at times moist and the temperature but little increased; at other times it is dry and the heat pungent. The pulse is in some cases full and strong beating at the rate of 120 in the minute; in others it is less so and in some the increase in velocity is scarcely perceptible; there is commonly constipation of the bowels and loss of appetite". This is the symptomatology in the type of fever which appeared in summer.

A more severe form occurred in the autumn. "The patient feels a degree of lassitude and prostration of strength (in some the latter symptom appears very considerable); this is succeeded by a sense of chillines extending along the spine and lumbar region which is followed by increased heat and severe headache, referred chiefly by the patient to the forehead and temples; and in the severer cases it extends in the course of the longitudinal sinus. A deep seated pain in the orbit is also experienced; the eyes are sometimes unnaturally prominent with a watery inflammatory appearance and impatience of light... There is a sense of uneasiness in

the epigastric region with nausea and, in some patients, a vomiting of a matter resembling bile; pains in the joints, back, calves of the legs, disturbed sleep and constipation of the bowels are amongst the symptoms usually observed. The pulse for the most part is full and hard, though not always, particularly when the gastric symptoms are severe... There is generally a throbbing of the carotid and temporal arteries with great thirst and considerable anxiety. The superior parts of the body are sometimes covered with a profuse perspiration but generally the skin is dry... If the disease be advanced the heat is often pungent and there is through its whole course a loathing of food. Severe rigors, sometimes, but not very commonly, precede the hot stage of the disease. When the attack is violent... the headache is still severe but accompanied by stupor, disinclination to answer questions and indifference to surrounding objects: the eyes have... a slight yellowness; the tongue is now covered with a thick yelow coat or is brown and dry in the middle, the edges having a red inflammatory appearance; the prostration of strength is considerable; the anxiety and pain in the limbs greater; the uneasiness in the epigastric region is urgent; and there is frequent vomiting of a matter resembling bile and most harassing singultus; the pulse under these circumstances is commonly much smaller varying from 100 to 120 and often is more frequent. The skin is at time moist or there are partial sweats and commonly a disagreeable faector is exhaled from the person or linen of the patient... There is occasionally considerable delirium which commonly terminates in a state of coma" and death. "The train of symptoms which have been first enumerated will not always be observed in the same patient... In the winter months this disease is often accompanied by severe and evident inflammation of the lungs. In the summer and autumn slighter affections of the lungs are occasionally observed but the patient seldom complains of this unless when asked".

None of the cardinal symptoms of undulant fever has escaped Burnett's attention — temperature and pulse variations, headache, pains behind the eyes, profuse sweating, subicteric tinge, epigastric discomfort, vomiting, constipation, rheumatic pains and "typhoidal" state in the more severe cases. However there is no mention of the physical signs of the disease, elicited by what to-day would be the commonplace method of palpation, such as the enlarged and tender spleen and liver; but he refers to the lung involvement and in fact he did observe, in some of the *post-mortem* examinations he performed, the "lungs inflamed with effusion", "adhesions to the pleura", enlarged liver and, on one occasion, "spleen rather large" (Burnett, 1816 b).

Cases of fevers of various descriptions remained the bugbear of the physician for a very long time. One sixth of all admissions to the military hospitals from 1816 to 1823 were fever cases with a mortality of one in forty-five. The most frequent was the "common continued fever" which included the "idiopathic" or "summer fever". This was so called because it made its appearance with the onset of hot weather (July to September) and subsided as the heat diminished. It was marked by severe headache, suffused eyes, acute pains in the chest, tenderness in the upper abdomen and bilious vomiting. It lasted six days.

Among the civilian population fever cases also formed a good proportion of admissions into the Civil Hospital constituting one-seventh of all admissions in 1821-23 (1300 out of 8736) while among those treated at home deaths from fever bore to deaths for all other diseases the proportion of one to ten, the villages of Mosta and Naxxar being the most heavily hit by this mortality (Hennen, 1830 b).

Aetiological theories

The influence of offensive exhalations or miasma arising from marshy grounds was invoked to explain certain outbreaks of fevers in Port Mahon and in Malta. With regard to Malta, an extensive marsh did exist at the Marsa or upper part of the harbour during the previous centuries at the time of the Order of St. John; so

much so that the inhabitants of the nearby *Casal Nuovo* (Raħal Ġdid, literally "New Village") had been obliged to abandon the village on account of the unhealthiness of the area. At the beginning of the 19th century this marshland was almost completely drained during the government of Sir Alexander Ball but apart from distilleries established there by British merchants the Marsa was still deserted.

Sir William Burnett wrote that it had been observed that ships fitting at the dockyard in the Marsa part of the harbour "are more subject to attacks of fever than those lying out at their anchors; and in moving a ship, where it was prevalent, into Bighi Bay (i.e. near the mouth of the harbour) the disease has uniformly ceased". It is not unlikely that the crews of these ships were victims of malaria. In fact it was discovered, very much later, that mosquitoes of the genus Anopheles occurred in Malta and it is probable that when affected ships were moved out of the range of flight of the insects no further cases appeared.

Apart from the factor of terrain, it was also believed that attacks of fever were precipitated by such "exciting causes" as intemperance in the use of wine and spirits, exposure to the sun and to night dews.

Controversies as to whether these fevers were of a "contagious" or "infectious" character were rife. "Contagious" diseases were those believed to be caught by contact; "infectious" illnesses were those communicated by the atmosphere. Apart from the personal animosities with which they were conducted, these disputes had practical implications of a social and economic kind. If these fevers were declared "contagious", quarantine measures were imposed with such attendant hardships as isolation of patients and contacts, the burning of their bedding and furniture and the suspension of social and commercial communications. If, on the other hand, they were "non-contagious", quarantine restrictions with their irksome consequences to the individual and the community were not enforced.

Among the opponents of Burnett's epidemiological ideas concerning the nature of the various fevers of the Mediterranean was Dr. (later Sir) William Pym (1772-1861). Pym had studied medicine at Edinburgh University and, after a brief period in the navy, had joined the army. In 1794 he was in the West Indies where he became familiar with the manifestations of yellow fever during an outbreak in Martinique (1794-96) when 16,000 troops died of the disease. He then served in Sicily (about 1806), Malta and Gibraltar. Here he was Superintendent of Quarantine at a time when it was suspected that yellow fever had gained a foothold from Cadiz and Malaga. In 1811 he was back in Malta as President of the Board of Health. He went to England the following year but volunteered to return to Malta in 1813 when plague broke out in the Island. In 1815 he published the *Observations upon Bulam Fever* which has been acclaimed as the first clear account of the disease also known as yellow fever. He died on the 18th March 1861 (Dictionary of National Biography, 1896; Hennen 1830c).

Pym favoured the adoption of quarantine measures while Burnett held the view that the fevers of the Mediterranean were "non-contagious" and that, therefore, quarantine could not prevent their dissemination. This provoked a reproach from Pym who, referring to Burnett's publication, stated that "there never was a book had a more mischievious tendency". Subsequent medical investigations, however, proved that Burnett was right.

Treatment

Therapy consisted in bleeding, blistering, purgation, oral medication and "antiphlogistic" measures.

Bleeding was resorted to for lowering the temperature, relieving the headaches and promoting sleep. Great reliance was placed on early and liberal bloodletting. Sometimes as much as ninety ounces of blood were removed over a period of six hours with the recovery of the patient; occasionally up to two hundred ounces were taken with "the most marked advantage"; more commonly bleeding was repeated hourly with the removal of

thirty to forty ounces each time. The operation was sometimes followed by syncope. The surgeon, therefore, kept a watch on the patient's pulse and when this showed signs of sinking the bleeding was stopped.

Burnett was enthusiastic about the beneficial results of bleeding which far from "inducing extraordinary debility and a protracted convalescence" produced a "speedy restoration to perfect health". The patients themselves, far from resenting it, asked for it! Burnett states that many of the patients felt its beneficial effects while the blood was flowing and quotes one such patient as saying: "Sir, I am as strong as ever; I am quite well; I feel the pain running out with the blood". Burnett continues: "So sensible were they of this that on a recurrence of the headache they directly sent for the assistant surgeon to have more blood taken from them".

When less profuse bleeding was desired, leeches were employed. From three to twelve of them were applied to the temples in severe headache or to the epigastric region when gastric symptoms were troublesome. To ensure a continuous flow of blood, a cupping glass was applied over the orifices made by the leeches by which means up to twelve ounces of blood could be procured.

Blistering was attended "with great success". Favourite plasters were *emplastrum epispasticum, emplastrum cantharidis* and *emplastra vesicatoria.* They were applied to the region of the stomach, between the scapulae, on the temples, on the forehead and on the nape of the neck. Great store was laid on brisk purgation, sometimes aided by clysters for which *Pulv, Jalap cum submurias hydrarg,* was prescribed. Hardly any faith was placed on drugs. Peruvian bark, antimonial powder, emetics and sudorifics were considered to be ineffective by some physicians or decidedly harmful by others. The "antiphlogistic regimen" consisted in giving the patient tepid or cold baths; in sponging his body; in the use of as few bedclothes as possible to cover him; and in prescribing *pediluvium* (footbath) to sooth the pains of the lower limbs.

Rev. William Pargeter

Another British physician flits across the medical stage in the very early years of the century in the guise of a clergyman. This elusive figure was Dr. William Pargeter (1760-1810). He studied at St. Bartholomew's Hospital and graduated M.D. from Marischal College, Aberdeen in 1786. In 1795 he abandoned medicine for the church and entered the Royal Navy as a chaplain. He was at the Battle of the Nile on the *Alexander* (1798) and subsequently served in Malta as Chaplain of the Garrison. In 1801, on the occasion of the burial in Malta of Sir Ralph Abercrombie, Commander-in-Chief of the British Forces in the Mediterranean, Pargeter delivered the funeral oration at the Protestant Chapel of Valletta. He extolled the military greatness and the "private virtues" of Abercrombie and the "noble exploits" of the British Army in Egypt; reminded his listeners of the uncertainty and transitoriness of human life and exhorted them "to put on the whole armour of God" to ensure their triumph over death. Pargeter retired from the navy in 1802 and died in Oxfordshire in 1810 (Hunter & Macalpine, 1963 and 1965; Leigh, 1961).

Pargeter is one of the early British psychiatrists of the modern era and the first British psychiatrist to come to Malta. We do not know, however, whether he took any interest in the medical affairs of the Island and particularly in the management of the insane. In his time the mentally sick were kept in the basement of the Civil Hospital at Valletta where Pargeter must have gone pretty frequently to minister to sick troops. Did Pargeter ever visit this basement in the Civil Hospital where the more dangerous patients were chained to the wall? If he did he would not have been scandalised by this scene as the same conditions prevailed in England where not even very highly placed personages were spared rough handling. The case of King George III, the first British monarch to rule over the Maltese Islands, is notorious. He suffered from recurrent attacks of mental disorder and was severely treated and even knocked down during his long illness.

Pargeter was one of the early reformers of management of the insane in England. In 1792 he published the *Observations on Maniacal Disorders* in which he showed that the physical restraint of mental patients, then in common use, was unnecessary. He stressed the importance of *rapport* between the physician and the mentally sick as a salutary influence in tranquillizing patients and leading them towards recovery. This was the emergent idea that gave rise to the so-called "moral treatment or management" of the insane which pervaded psychiatric therapy during the rest of the 19th century.

Conditions in England began to improve in 1827 when two acts of parliament provided "asylums" and regulated the care of "pauper and criminal" mental patients (Hodgkinson, 1966). In Malta the humane treatment of the insane was ushered in ten years later when Dr. Thomas Chetcuti, the pioneer Maltese psychiatrist, set patients free from their chains and abolished the use of the stick to subdue excited patients (1838) (Cassar, 1949).

Vaccination

Two other British physicians — Dr. Joseph Marshall and Dr. John Walker — passed through Malta in the very early years of the century. It is very likely that they met Pargeter but, in contrast to him, they have left an indelible mark on Maltese medical history.

Not long after Edward Jenner discovered vaccination against smallpox in 1798, the British Government took steps to introduce it to its naval and military forces and its possessions overseas. Malta was thus one of the first territories to benefit from this policy.

In the early days of July 1800 Dr. J. Marshall and Dr. J. Walker left England for the Mediterranean. Both of them were friends of Jenner and had obtained the vaccine lymph from him. When they reached Malta smallpox had broken out in the fleet and Sir Alexander Ball ordered all men in the squadron based on Malta to be vaccinated.

Dr. Walker eventually departed for Egypt with the fleet under Sir Ralph Abercrombie (20th/21st December 1800). Dr. Marshall remained in the Island to enable the inhabitants to avail themselves of the occasion to vaccinate their children. An Italian translation of Jenner's *A Continuation of Facts and Observations* was published in Malta, probably as a form of health propaganda, and a number of children were inoculated in the presence of Dr. Luigi Caruana, the *protomedico* or Chief Government Medical Officer, and Dr. Lorenzo Cassar, the Palace Physician and Principal Physician of the Civil Hospital. The experiment was a success and from then onwards vaccination against smallpox became standard public health practice in the Maltese Islands (Bellet, 1801; Cassar, 1965b and 1969).

Dr. Walker was present at the battle in which Sir Ralph Abercrombie was fatally wounded. He returned to England in 1802 and was made resident vaccinator of the Royal Jennerian Society. A breach between him and Jenner led to his resignation from the Society in 1806 but he continued to vaccinate until his death in 1830. Dr. Marshall was later appointed Physician Extraordinary to George III (Fisk, 1959).

Maltese Civilian Practice

Glimpses of the state of Maltese civilian medical practice at this period may be gleaned from Dr. William Domeier's *Observation on the Climate, Manners and Amusements of Malta* published in London in 1810. Dr. Domeier (1763-1815) spent a few years in the Island in the medical service of the British Army as Physician to Foreign Troops, probably from 1805 to 1808 (*Almanacco*. 1807). He was a German from Hanover who graduated doctor of Medicine in 1784 at the University of Gottingen. After his turn of duty in Malta he was admitted a Licentiate of the College of Physicians of London (1809) where he settled. He died in 1815 (Munk, 1878).

He was favourably struck by the mild climate and the satisfactory state of the public health of the Island so much so that he considered it eminently suitable as a resort for invalids and convalescents such as those suffering from consumption,

dropsy, rheumatism and chronic dysentery. He found the Island to be free of the "yellow fever of the West Indies and North America", of the "malignant intermittent fever" of Italy and of the ophthalmia and elephantiasis of Egypt. The only epidemic that occurred during his residence here was one of smallpox which, however, was easily checked by a general inoculation with the vaccine.

Domeier was rather critical of local professional standards. In his opinion the best Maltese physician was Dr. Cleardo Naudi from Axiaq (1780-1837). Naudi was "acquainted with literature and a friend of natural history" and, what was rare in those days, had a good command of the English language. In fact he translated several religious and biblical writings for the Wesleyan Missionary Society from English into Maltese (Cremona, 1940). From 1801 he studied physics and mathematics at the Malta University *(Acta,* 1800-32a). When the Chair of Experimental Chemistry and Natural History was instituted in June 1805, Naudi was chosen to fill the post (1805-34).

In October 1806 he delivered an oration in Italian at the Church of the University on the occasion of the opening of the academic year. He reviewed the origins and gradual growth of various branches of science including astronomy, navigation, physics, chemistry and medicine from the earliest times to the dawn of the nineteenth century; and records the foundation of a "school of practical chemistry" and of a Botanic Garden with specimens from "the four quarters of the world" for the use of the medical students of the Malta University (Naudi, 1806).

Some years after Domeier left the Island, Naudi was sent to London by the Government (April 1812) "for the purpose of making himself better acquainted with the regulations of the schools of medicine in that country and of the hospitals." He stayed there for twenty-one months attending lectures in medicine, surgery and chemistry at St. Thomas's and Guy's Hospitals; a course of comparative anatomy and of botany at Brook's Museum; and courses in midwifery, dentistry and ophthalmology as well as "experiments in philosophy".

Naudi resigned the professorship in 1834 and died three years later in his 57th year "in consequence of the exertions made by him in attending patients" during the cholera epidemic of 1837 *(Despatches* 1836-37; Malta Government Gazette 1837).

Another "man of talents" was Dr. Luigi Caruana, Chief Government Medical Officer, who was in charge of the Lazzarett and the "Medical Police" but who spoke no English and only "very broken French".

The practitioner with the widest practice was Dr. Francesco Leone Gravagna, one of the physicians on the staff of the Civil Hospital. He was a "reasonable good man". He later became Chief Government Medical Officer and a member of the Council of Health. He was carried off by the plague of 1813 (Henner 1830d).

Domeier found that Maltese surgeons were chary of performing serious operations and only undertook to carry out bleeding, cupping and blistering. Dr. Giuseppe Speranza, however, was "the best of them". There were no dentists.

Pharmacists, too, received Domeier's strictures as they had "little knowledge of chemistry, pharmacy, botany and mineralogy". There was only one English chemist's shop but even this was "far from being perfect as it was run by two army surgeons who, besides selling medicines at a high price, generally understood little of pharmacy". There were other army surgeons of whom some did midwifery such as Mr. Iliff, the hospital mate, who had the largest practice in this line.

Public Medical Controversies

A feature of the medical world of those days were the medical disputes in which members of the profession publicly engaged with one another in print — disputes which were often spiced by personal rebukes and coloured with bitter words. An instance of such a controversy among Maltese physicians is furnished by the polemic on the Brunonian System between

Dr. Lorenzo Cassar and Dr. Gio Batta Saydon .

In 1780 John Brown (1735-1788) of Scotland propounded a medical theory in his *Elementa Medicinae* according to which disease was the result of either too much stimulation or lack of it, especially the latter. He, therefore, classified all diseases into sthenic or asthenic and the treatment consisted of giving stimulating drugs in large doses. The theory caused a stir in the United Kingdom, Germany, France and Italy. It found adherents and opponents also in Malta where a polemic dragged on for a number of years between the two physicians already mentioned.

After studying philosophy and the "medical institutions" *(istituzioni mediche)* for two years in Malta, Dr. Cassar continued his studies at Naples University. He did his clinical practice at the *Spedale degli incurabili* and at the end of a course of three years obtained the doctorate of medicine of the University of Salerno in 1789. He specialised in teaching "the mutes to speak" and after practising at the Holy Infirmary of Valletta was granted the warrant to practice in September 1790 (Archives 1196.RML). On the 9th September 1800 he was nominated Palace Physician by Sir Alexander Ball and by the beginning of 1802 he had become Principal Physician of the Civil Hospital of Valletta.

In the same year he wrote a paper, in which he criticised and opposed the Brunonian System as John Brown's medical ideas came to be called. He read it at a "solemn literary public meeting held in the Great Hall of the Maltese Hospital in the presence of H.E. the Royal Commissioner, Sir Charles Cameron, on the 10th June 1802". Among the audience were the Presidents, professors and colleagues. It was later published in pamphlet form in 1802 and again in 1808 (Cassar, 1802).

He exposed the "errors and irrationality" of the Brunonian concepts and professed himself a follower of the "venerable ancient Hippocrates and his successors" whose teaching was the "genuine result of experience and not of selfishness and bizarrerie" as happens with propounders of "systems". He declared himself to be an admirer of William Cullen (1710-90) and of Thomas Sydenham (1624-89), "luminaries of the English Medical Faculty" (Guthrie, 1947).

Dr. Gio Batta Saydon, born in 1773, studied medicine at the University of Salerno. During the insurrection of the Maltese against the French he attended the members of the Zurrieq battalion free of charge. In 1801 he was *medico dei poveri* at Bormla and during the plague of 1813-14 was made Principal Physician of the emergency hospital set up in Villa Bichi for the plague stricken.

It has been claimed that he was the first doctor in Malta to recognise hydrophobia. He wrote a *Relazione dell'idrofobia accaduta in Malta l'anno 1809* (Report on Hydrophobia as it occurred in Malta in the year 1809) which remained in manuscript form and has been lost. He treated the sick during the smallpox epidemic of 1830 and the cholera outbreak of 1837. He died on the 1st October 1841.

Saydon was a strenuous exponent of Brown's theory which he defended against the criticism of Cassar in a pamphlet entitled *Il sistema di Brown difeso da varie imputazioni e calunnie del Dr. Lorenzo Cassar* (Brown's System defended against the various accusations and calumnies of Dr. Lorenzo Cassar) published in Messina in 1808. As in other such doctrinal disputes of those days, Saydon's rejoinder does not go beyond abstract arguments and personal reproaches directed against Cassar who maintained that clinical experience coupled with the understanding of the nature of disease constitute "the true system, the most reliable guide and the true mariner's compass of the prudent physician in traversing the stormy ocean of medical practice" (*Il Globo* 1841; Mifsud Bonnici, 1962). However, in spite of Cassar's condemnation of Brown's theory, Brunonian medicine had not yet disappeared from Malta twenty years later (Hennen, 1830e).

Academic standards

Domeier found that the teaching staff of the Medical Faculty of the University consisted of only one lecturer — Dr. Lu-

dovico Abela — who taught all subjects for two hours a day. To understand how the University had been reduced to such a state it must be borne in mind that Napoleon had suppressed the University in 1798 and tried to replace it by a Central School where medical subjects were not to be taught at all. He decreed, however, that courses in anatomy, medicine and midwifery were to be held at the Civil Hospital. When the Maltese rose against the French, all academic activities ceased from September 1798 to September 1800 when the French capitulated and left the Island.

One of the first acts of Sir Alexander Ball, who was then President of the Maltese Provisional Government, was to reopen the University on the 6th November 1800 with Faculties in Law, Theology and Medicine.

The students of medicine entered upon the academical course proper after a preliminary study of the humanities, philosophy, mathematics and physics (Cassar Pullicino, 1958). The study of botany, and of anatomy and surgery did not figure in the medical curriculum and Domeier remarked upon the neglect of botanical studies and the absence of a Professorship in Anatomy and Surgery.

At a time when pharmaceutical remedies were mainly of a vegetable kind, a knowledge of plants was rightly considered essential both for pharmacist and physician. In fact botany was being taught in Malta as early as the close of the 17th century and a Botanical Garden was planted in 1690 in the ditch of Fort St. Elmo near the Holy Infirmary for the use of medical students. It was entrusted to Dr. Joseph Zammit, Teacher of Anatomy and Surgery. The garden fell into disuse in 1798 during the turmoil that followed the advent of the French to Malta. Napoleon, however, mindful of the necessity of a Botanical Garden had decreed that such a garden was to be established in the vicinity of Valletta. This project was carried into effect during the succeeding British domination when the Rev. Fr. Carlo Giacinto was appointed to the Chair of Botany in our University by Sir Alexander Ball in 1805.

The new garden was set up at Floriana adjacent to Sarria Church on the site of the present Government Elementary School. In 1806 was published the first catalogue of plants under the name of *Index Plantarum Horti Botanici Melitensis (Storia della società medica d'incoraggiamento,* 1845; Cremona, 1967).

It is obvious from this short account that Domeier's stay in our Island (1805-8) coincided with the initial phase of the revival of the study of botany in Malta.

With regard to the study of anatomy and surgery, there is undoubted evidence that these subjects were being taught at the Civil Hospital of Valletta, after the revival of the University in 1802. This was. in a way, a continuation of the policy laid down by Napoleon two years previously.

The regulations of the Civil Hospital issued on the 20th March 1802 make references to (a) four students of Physic *(allievi di fisica)* who bled patients, did cupping, applied vesicants, fomentations, cataplasms and inunctions under the direction of the Master of Physic *(Maestro di Fisica)*; they accompanied the Senior Physician on his rounds; (b) five Licensed Students of Surgery *(allievi patentati di chirurgia)* and (c) an unspecified number of Supernumerary Surgical Students *(allievi supranumerari di chirurgia).* All these categories of students received a salary of 15 to 20 *scudi* a month (one *scudo* = 1s. 8d.)

The following extracts from the hospital regulations give an indication of the nature of the students' training and duties:-

(a) The Senior Surgeon was allowed to entrust a few of the dressings to the cure of some "good students to train them in the practice of surgery".

(b) The Junior Surgeons were enjoined "to supervise the surgical students so that they do not absent themselves from the ward round or leave hospital when on duty"; to make sure that they carried out all their work and to report defaulters to the hospital authorities; and finally to instruct the students in the medication and bandaging of patients.

(c) The Junior Surgeons on duty

was to perform "anatomical dissection for study purposes with the help of the surgical students".

(d) The students had to "attend the daily ward rounds, morning and afternoon, to carry out the orders given them by the Principal Surgeon. They were also to follow the directions of the Junior Surgeon and medicate the patientts suffering from ringworm *(tigna)*.

(e) All the Students of Physic and of Surgery had to attend the daily lesson in anatomy and surgery. The lecturer had to draw up a list of absentees every week and submit it to one of the Presidents (two of whom formed a sort of lay hospital management committee). The Presidents decided upon the punishment to be awarded to the offender including dismissal from employment.

(f) The surgical students administered internal medicines in conformity with the prescriptions of the Senior Surgeon.

(g) They were taught the "obstetric art" by a Master of Obstetrics *(Maestro di Ostetricia)* both "orally and in writing".

(h) They were on call during the night according to a roster *(Piano per il regolamento dell'ospedale di Malta,* 1802 b).

The first men to qualify from the newly restored Medical Faculty were Aloysius Gravagna and Alexander Vella. After undergoing a private examination by three examiners and sustaining a thesis in public in the Church of the University, they had the degree of Medical Doctor conferred upon them in August 1804. A total of eleven medical men qualified between August 1804 and July 1812. The studies were subsequently interrupted temporarily by the plague outbreak from May 1813 to October 1814 *(Acta* 1800-1832 b).

Shortcomings in medical studies and practice were not limited to Malta at this period. They coincided, to a certain extent, with what was happenning in England. In fact the practice of physicians, surgeons and apothecaries was still unorganised except in London; so much so that in 1806 the College of Physicians tried to tackle this problem by formulating a scheme which aimed at raising the educational standards of the profession by laying down requisites in age, training and qualifications for the different categories of the medical profession. The aims of the College were only partially achieved at this period with the passage of the Apothecaries' Act in 1815 (Holloway, 1966).

In Malta the gaps in the academical teaching of the University were filled towards the end of the decade by Dr. Agostino Naudi, the brother of Dr. Cleardo Naudi already alluded to.

Born in 1783 Agostino Naudi at first meant to study civil and military architecture but at twenty years of age he turned to medicine. He pursued his medical education at the Medical Academy of Naples qualifying as physician and surgeon at the University of Salerno, being the first among three hundred students.

On his return to Malta he taught anatomy and dissection in the cemetery of the Civil Hospital of Valletta in substitution to Dr. Aurelio Badat who had given up teaching because of senile mental decay (1810). Naudi had to suspend his lectures and demonstrations during the plague epidemic of 1813-14.

Following the death of Dr. Ludovico Abela, Professor of Medicine (1800-15), Naudi taught medicine privately, his students receiving the doctorate of the University of Malta in 1819. From 1820 onwards he substituted Dr. Stefano Grillet, Professor of Medicine (1815-31) who had become chronically ill. He also taught botany, physiology, pathology and surgery.

He is alleged to have been the first to discover and describe the middle meningeal nerve for which he was commended by the Academicians of Paris and granted the diploma of *Insigne maestro di anatomia umana* (Outstanding master of human anatomy) by the Academy of Rome.

He wrote an account of the plague of 1813-14 in Latin. He submitted it to the Medical Academy of Montpellier by which "he was judged worthy of special and honorific mention". Dr. L. Barthelemy declared it to be "a masterpiece of pathology, therapy and preventive hygiene". The manuscript was still extant in 1864

but cannot now be traced. From sketchy references to it in contemporary medical literature we know that it dealt with the atmospheric phenomena and the state of public health prevailing immediately before the outbreak such as the mildness of the weather, the increased incidence of sudden deaths which excited "public observation and alarm", the remarkable frequency of hydrophobia and of intestinal infestation with ascarides and earthworms which were "never so general and so numerous in the memory of man" (Hennen, 1830 f).

In 1827 Naudi published a treatise on the cultivation of the silkworm to encourage the Maltese farmer to undertake this form of industry.

In the following year he wrote a brief review, which remains in manuscript, of the history of yellow fever. This disease had been causing considerable anxiety to the health authorities of Malta since October 1804 when it occurred on an epidemic scale at Gibraltar. Mortality was high. Two-thirds of the inhabitants left the Rock to escape the disease and some of them, mostly Jews, came to Malta in the early days of the outbreak. The quarantine regulations of Malta were tightened against ships coming from infected places. Samuel Taylor Coleridge, who was then in Malta, states that a ship from Ragusa with its crew dying of yellow fever was forced to sea from the Island (Sultana, 1969; Coburn, 1962 b).

Gibraltar was declared free from the disease on the 1st January 1805 but the dread of the importation of the infection into Malta persisted for many years afterwards.

In his account of the history of yellow fever, Naudi traced its outbreak in Pennsylvania in 1740 and its subsequent appearance in Gibraltar with which Malta was then in close and frequent communication by sea. He quoted the observations of Robert Lind on the disease and expounded his own ideas about its spread from an "infected" place to a healthy one by means of atmospheric air.

Dr. Agostino Naudi died on the 11th November 1830 (Camilleri 1831; *Malta* 1907; Naudi 1827 & 1828).

A Professorship in Anatomy and Surgery was set up in 1822 with the appointment of Dr. Gavino Patrizio Portelli (1795-1865) to the Chair (Malta Government Gazette 1822). In the first decade of the 19th century, Gavino Patrizio Portelli, though still a youngster, was already serving in the Military General Hospital at Valletta under Sir William Franklin, the Inspector of Military Hospitals, who took the boy under his patronage and encouraged the boy's parents to send him to study medicine in London — which they did. In London he studied under Constantine Carpue and then joined the 10th Infantry Regiment as Assistant Surgeon. In December 1813 he took part in the expedition under Sir Thomas Graham against the French in Holland and was in the front line during the attack on the fortress of Bergen-op-zoom when he was slightly wounded. In 1816 he was made a member of the Royal College of Surgeons. He remained with his regiment until 1818 when he was called from Corfu by Sir Thomas Maitland to occupy the post of Principal Surgeon at the Civil Hospital of Valletta *(Corriere mercantile,* 1865).

By the time Portelli became Professor of Anatomy and Surgery in 1822, the academic standards of Maltese medical men had risen considerably. Pharmacists, also, had become "expert in the various pharmaceutical operations". In fact a British physician serving in Malta, Dr. John Hennen, Inspector of Military Hospitals, declared that "physic and surgery are not on a lower footing in point of respectability in Malta than among the continental nations in the neighbourhood". It is true that surgeons were still somewhat conservative in treatment compared with their British counterparts but part of this fault lay with the patients who were "so wedded to old practices and established usage that the physician who should attempt any innovation in this respect would assuredly be left without any subjects to practise upon". However, "modern medical and surgical practice" was ably taught and demonstrated in the Civil Hospital (Hennen, 1830 g).

Epilogue

The medical highlights of the decade 1800-10 are Burnett's clinical description of Undulant Fever; the introduction of vaccination against smallpox; the revival of the University with its Medical Faculty; the initiation of the Government's policy of sending Maltese medical men for post-graduate studies to the United Kingdom and the beginning of the first contacts between British and Maltese medicine.

On the debit side we find that academical training in medicine was modest; surgical practice was limited in scope; the running of hospitals was inspired by the medieval concept of "charity" towards the indigent and not by the idea of service to all members of the community; "fever cases" taxed the physician's time and efforts but their causation still eluded him; treatment, consisting mainly in bleeding and purging of the patient, was ineffectual; time and energy were dissipated in abstract theorising and sterile controversy.

In assessing the men and ideas of the period under review in Malta we must remember that we are judging them from the vantage point of the twentieth century. To be fair to them we must bear in mind that the pattern of their lives mirrored the European intellectual and medical scene of their days and it is within this framework of time and state of knowledge that we must judge them to give them a fair trial. Whatever their deficiences, those men did not live in an isolated cultural backwater but were always in the main stream of Western thought and events.

The world in which they were brought up and trained was being swept away by a quarter-century of war sparked off by the French Revolution of 1789 and ending at Waterloo in 1815. In 1810 they were unaware that they stood on the threshold of a new era when budding scientific and medical ideas would bear fruit in the following decades. The physiology of respiration would be understood thanks to Lavoisier's contribution on the role of oxygen in the processes involved; the value of Jenner's prophylactic vaccine against smallpox was being widely recognised; Corvisart was propagating the use of percussion in the diagnosis of diseases of the chest and heart (1808); James Carrie (1756-1805) introduced the clinical thermometer; Laennec invented the stethoscope in 1816; and a new more rational approach to the management of the mentally sick was being adopted.

All these advances lay in the future path of our professional ancestors — British and Maltese — at the close of the first decade of the 19th century but before they were to taste these benefits they were called upon to bear the full weight of the most dreaded medical calamity of all times — the plague that descended upon them and sorely tried them in the Malta epidemic of 1813-14; but that is another story that has already been told.

APPENDIX I

Doctoral College
in the Faculty of Medicine
(Collegio Dottorale
nella Facoltà della Medicina)
1805

Dr. Luigi Caruana
Dr. Giovanni Agius
Dr. Francesco Dimech
Dr. Francesco Leone Gravagna
Dr. Stefano Grillet
Dr. Giuseppe Ciaja
Dr. Giuseppe Dingli
Dr. Gabriele Pullicino
Dr. Aurelio Badatt

Master of Anatomy and Surgery
(Maestro di Anatomia e Chirurgia)
1806

Dr. Aurelio Badatt

Master of Obstetrics
(Maestro di Ostetricia)
1806

Dr. Francesco Buttigieg

(*Diario, lunario e calendario delle isole di Malta e Gozo per l'anno 1805*, Malta, p. 17: *Almanacco delle isole di Malta e Gozo*, Malta, 1806, p. 29).

APPENDIX II

Doctors graduating from the University from 1804 to 1812

Aloysius Gravagna — 1804
Alexander Vella — 1804
Joannes Franciscus Falzon (Mosta) — 1806
Salvatore Saydon (Zurrieq) — 1807
Lucas Borg (Balzan) — 1809
Xaverius Micallef (Qormi) — 1809
Paolo Antonio Azzopardi (Siggiewi) — 1810
Felix Brignone — 1812
Joseph Galea — 1812
Gregorius Gatt (Birkirkara) — 1812
Albinus Borg (Balzan) — 1812.

(Acta Academiae Melitensis 1800-1832, fols. 18 to 52).

APPENDIX III

Women's Hospital Medical Staff
1802

Dr. Giuseppe Ciaia (sic)
Dr. Stefano Grillet
Dr. Giuseppe Dingli *(supranumerario)*

Men's Hospital Medical Staff
1802

Dr. Francesco Dimech
Dr. Francesco Leone Gravagna
Dr. Leopoldo Bernard
Dr. Lorenzo Cassar

1805

Senior Physicians
(Medici primari):

Francesco Dimech
Dr. Francesco Leone Gravagna
Dr. Giuseppe Ciaja
Dr. Stefano Grillet
Dr. Lorenzo Cassar
Dr. Giuseppe Dingli

Junior Physicians
(Medici secondari o pratici):

Dr. Emanuele Locano
Dr. Salvatore Cutajar
Dr. Giuseppe Schembri

(Senior) Surgeons
(Chirurgi):

Dr. Aurelio Badatt
Dr. Giuseppe Speranza
Angelo Ventura

Junior Surgeons
(Chirurgi secondari):

Antonio Casha
Giovanni Andreotti
Carlo Grech

Pharmacist
(Aromatario):

Giuseppe Farrugia.

(*Piano per il regolamento dell'ospedale di Malta.* Malta, 1802, pp. 1 & 2; *Diario, lunario e calendario delle isole di Malta e Gozo per l'anno 1805,* Malta, pp. 17-18; *Almanacco delle isole di Malta e Gozo,* Malta, 1806, p. 29).

APPENDIX IV

Naval Hospital Medical Staff
1803-4

Surgeon in Charge:—
Mr. John Gray — appointed 25th November

Surgeon's Mate or Assistant Surgeon:—
Mr. John William Ellice — appointed 22nd December

Governor and Superintending Officer:—
Lieut. William Pemberton — appointed 21st December.

Physician:—
Dr. Leonard Gillespie (1758-1842)
He was the first physician to be appointed to the Malta Naval Hospital. He joined the *Victory* as Physician to the Fleet in January 1805.

1807

Surgeon:—
Mr. John Allen

Assistant Surgeons:—
Mr. John Regnell
Mr. Lorenzo Zammut (sic)

(Nicolas, N. H. The Dispatches and Letters of Vice Admiral Lord Viscount Nelson, Vol. V. London, 1845, pp. 294, 322 & 325: Gordon Pugh, P. D. Nelson and His Surgeons, Edinburgh, 1968, p. 26; *Almanacco delle isole di Malta e Gozo,* Malta, 1808, p. 41).

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MAN'S ERECT POSTURE

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This is an abridged version of a Public Lecture given under the auspices of the Royal University of Malta Biological Society in November 1969.

This lecture is an attempt to describe briefly how, when and where Man came by his erect attitude.

Though the upright posture is one of the great and most conspicuous of human characteristics, several animals, as the squirrel, bear, kangaroo and some of the monkeys and apes, can maintain their trunk upright; even some of the extinct dinosaurs are known to have walked upright. In this connection it is interesting that surveys have constantly shown that the animals most favourite with children are those whose postures are in some ways or at some times rather vertical, as the chimpanzee, the monkey, as well as the penguin, the most vertical of all birds.

In primitive aquatic animals, the limbs are propelling non-supporting organs being mobile but with little stability. With the change from the aquatic to the terrestrial habitat, the limbs have to temporarily lift and support the body weight during the act of propulsion while at the same time maintaining their propelling function, so that some more stability is added to their mobility. In the terrestrial four-footed pronograde animals, all 4 limbs become permanently supporting though ambulatory organs. Some of these animals, however, move forwards by a hopping type of movement during which the hind limbs take an increasing share of supporting the body weight; this becomes even more so with the adoption of arboreal life where the animal advances along the branches of a tree by reaching ahead for new holds with its front limbs. Finally the fore-limbs lose their function of support and, while the animal is in motion, the hind limbs become the only support of the body. These characteristic stages in the development of the upright or orthograde posture culminate in the evolution of plantigrade Man when fore-limbs and hind-limbs acquire human characteristics and the typical poise of the head is attained.

Man's posture has evolved through 3 stages. In the Hylobatian stage the pronograde monkey differentiated into the gibbon, a small anthropoid which is orthograde in its gait, holding the body upright in the phase of progression, but which rests and even sleeps in the sitting position. In the Troglodyte stage the small anthropoids differentiated into the great anthropoids (e.g. chimpanzee, gorilla and orangutan), animals which, being heavier, have a more marked orthograde posture and gait, and which rest only when the body is laid prone. In the final Plantigrade stage, characterised by Man, structural changes took place which were almost entirely confined to the lower limbs.

The evolution of the erect posture entailed structural as well as physiological alterations in all parts and systems of the body. Most of these changes occurred in the adaptation to arboreal life but some were more recent, resulting from the achievement of Man to walk upright.

The basic change in the evolution of posture was the shift in the body's centre of gravity. As we move up the evolutionary scale, the centre of gravity tends to move backwards from the head and shoulder to the hind-limb and tail region. In leaping animals, the hind-limbs increase in size and the tail enlarges, the centre of gravity coming closer to the organ of propulsion (the hind-limbs). Higher up in evolution, the centre of gravity tends to move well back over the hind-limbs, so allowing the sitting position and freeing

the fore-limbs for manipulation and, later on, enabling Man to stand.

Four-footed animals use their mouth as a food-getting organ so that this is situated as far as possible from the face, especially from the eyes; these animals, therefore have a long snout. With the development of the erect posture and the consequent use of the fore-limbs for grasping, the animal now seizes the food with its hand and so conveys it to the mouth, with a consequent gradual recession of the snout region. The snout is, however, still quite large in the Great Anthropoids and its final recession is only reached in Man.

With the recession of the snout, the cranial becomes larger than the facial part of the skull, the reverse of the situation in the lower primates. The occipital condyles, which articulate with the vertebral column, move forwards on the base of the skull so leading to an increasing diminution in the angle between the axes of the head and that of the trunk and this ultimately becomes almost a right angle. There is a consequent reduction in the strength and attachment of the muscles at the back of the neck and the development in Man of counterbalancing muscles on the front, such as the sternomastoid. Ultimately, the characteristic head-poise of Man is attained, the whole skull becoming practically balanced on the vertebral column; this poise not only permits an increased range of movement, but also allows the head to be placed to best advantage to catch sounds coming from any direction(so that the movements of the pinna of the ear remain no longer necessary).

Simultaneously, changes occur in the vertebral column. With the evolution of the orthograde from the pronograde posture there is shortening of the lumbar spine by sacralisation in a headward direction, but with the change later on into the plantigrade posture of Man, there is relengthening of the lumbar spine by sacralisation in a tailward direction as well as by an increase at the upper end of the lumbar vertebral series. Apart from alterations which occur in the curvatures of the vertebral column as the result of changes in the centre of gravity, there are also changes in its type of movement. In four-footed monkeys which leap from the hind-limbs, the lumbar spine acts as a flexible lever which moves the upper part of the body on a fixed pelvic base, the centre of gravity being the anticlinal vertebra, i.e. that vertebra with a straight spine which separates the retroverted thoracic from the anteverted lumbar spines. In the bipedal anthropoid and in Man, this springing in the middle of the backbone is absent and the vertebral column, whose spines are uniformly sloping, acts as a whole — as a pillar rather than a spring. Associated with this change in the type of movement, structural modifications occur in the spinal muscles, especially those of the lumbar region; these gain an ever-increasing attachment to the pelvis so rendering this a fixed base from which the erector spinae may act.

In four-footed animals the pelvic outlet looks backwards and forms the highest part of the abdominal cavity, the symphysis is at the lowest part of the pelvis, and a tail is still present. With the assumption of the upright posture, the pelvic outlet becomes the lowest part of the abdominal cavity, the symphysis moves up in the direction of the umbilicus, there is a widening of the subpubis arch, and early coccygealisation and disappearance of the tail. The increase in the pelvic outlet anteriorly, the added weight of the abdominal contents, the increase in the intra-abdominal pressure bearing on the pelvic floor, which now lies horizontally, and the disappearance of the tail (which normally acts as a perineal shutter) all lead to a weakening of the pelvic outlet in the bipedal posture. This could possibly account for conditions like uterine and rectal prolapse occurring in orthograde but not in pronograde animals.

Anthropoids appear typically "slouched forward". Structurally there is no difference between the anthropoid and the human shoulder and Man only keeps his shoulders braced back because the supporting reflex postural mechanism has in him been perfected. The bones of the

arm are longer in the brachiators and thicker in the heavier anthropoids. The hands in orthograde animals and in Man assume functions which they do not have in the pronogrades. Four-footed animals rely mostly on their teeth for their offence and defence reactions but Man uses his hands for these purposes; Man is in fact said to be the only fisted creature on earth. Man also utilises his hands for the tasks of scratching and cleaning: four-footed animals only scratch with their back-foot, monkeys and apes can use either front or back limbs, whereas Man of course uses only the fore-limb for this purpose. The human hand also takes on the function of a tactile organ from the whiskers on the snout associated with lower animals.

The upright stance involves changes in the chest and in the mechanisms of respiration, changes which are necessary to meet the more active use which Man makes of his body. In four-footed animals muscular slings extend from the shoulder girdles; they help to support and transmit the body weight to the upper limbs and in so doing compress and flatten the lateral walls of the chest. In the orthogrades, however, the body weight has often to be supported by the arms during brachiation so that the chest now becomes flattened from front to back through compression by the anterior and posterior thoracic muscle layers. The sternum becomes fused into a single plate to strengthen the anterior chest wall against these greater stresses, the ribs and the muscles acting on them become modified, the contours of the diaphragm altered, while the anterior abdominal muscles, which in pronogrades extend over the whole of the front of the chest, become drawn downwards, losing their attachment to the upper 4 ribs. These changes lead to an alteration in the mechanism of respiration, — to an upper type of breathing with increased respiratory importance of the apical region of the lungs. Concomitantly the heart, which in quadrupeds comes in contact with the diaphragm only at its apex, becomes in bipedal animals firmly bound to the diaphragm; the diaphragm thus becomes attached to the lung roots via the heart, thus increasing the aeration of the lung apices.

The shape of the abdominal cavity seems to vary with posture. Four-footed monkeys have elongated loins and, as their chest is situated lower than their flanks, the abdominal organs tend to sag against the diaphragm. In bipedal forms, the loins shorten and the abdominal cavity widens from side to side becoming flattened antero-posteriorly; this affects the shape of the contained organs so that, for example, there is partial disappearance of the caudate lobe of the liver. In quadrupeds there is no compression of the abdominal organs because these animals are enclosed in a cylinder of spinal postural muscle from which fore- and hind-limbs act. In orthograde animals and even more so in Man, however, the arms no longer support the body and the thighs become entended so that the abdominal wall muscles now exert continuous and marked compression with a tendency to displacement of the abdominal organs; this is remedied by improved visceral support, namely more extensive peritoneal fixation and the suspension of viscera from the diaphragm as well as from the backbone.

The groin is a distinctive feature of Man's anatomy. Only in one animal, the gorilla, do we find a tendency towards its appearance. Its formation results from the extension of the iliac crests and the shortening of the anterior border of the ileum. In the male especially, its defence mechanism may occasionally be weakened giving rise to the formation of an inguinal hernia.

The erect posture also presents problems in the sphere of sex. Man and other orthograde animals walk erect so that their genital regions are more evident than they are in quadrupeds. Primates use the rear approach in mating during which the female genitals are visible to the male; the assumption of the erect posture and the consequent swinging of the vagina to the front has led Man to adopt the frontal approach. This could possibly explain the appearance of the secondary sexual characters, such as the beard, breasts, pubic hair, etc., on the

front of the body. Pronograde animals walking on all fours have their vaginal passage almost horizontal, but the erect human female walking bipedally has her vagina almost vertical; male seminal fluid deposited in it would therefore tend to gravitate out and be lost were it not for human orgasm which often leaves the female exhausted so that she has to lie horizontally for some time after intercourse.

Associated with the vertical posture, changes also occur in the nervous system. The centres of the mid-brain and cerebellum which regulate postural tone become more elaborated and the reflex centres in the spinal cord more coordinated. The vasomotor postural mechanism, which controls the distribution of blood, becomes specialised to allow blood to be propelled upwards against gravity, so ensuring a continuous supply to the brain. The stretch reflex also becomes more developed.

We finally come to the changes in the lower limbs, especially those in the foot: it is indeed the structure of the foot which mostly severs Man from all other existing primates.

The adoption of an erect posture brings the femur in line with the vertebral axis so that there is a more complete rotation of the hip joint (hence the permanent twist in the fibres of its capsule) as well as an increase in the size of the gluteal muscles. As the leg becomes more supporting in function it loses its power of pronation and supination, the rotator muscles of the tibia and fibula shifting their origin and becoming flexors and the fibula becoming markedly reduced.

But above all, changes occur in the foot. The anthropoid and the human foot are similar in structural composition and differ only in the arrangement and form of their components. The basic difference is that whereas the anthropoid foot has a free mobile great toe used as a grasping thumb, in Man the great toe becomes merged with the metatarsal series forming the part of a rigid supporting plantar arch. In the initial developmental stages the human and anthropoid foot are alike and it is only later that the great toe of the anthropoid foot attains a prehensile stage while that of the human foot retains its primitive adducted position. In the newborn the human foot, like the anthropoid one, is inverted and shows the same flexion lines on its sole: the human baby at first walks on the outer side of its feet and only later with eversion of the foot does the inner margin come to bear the weight of the body.

The prehensile foot has a 3 functional elements — tarsal, metatarsal and digital. The increase in weight of the body associated with the change from the small to the great anthropoid stage leads to an increase in length and strength of the supporting tarsal element while the metatarsal elements remain the same and the grasping digital elements shorten. In Man, the foot becomes modified as a "stepping-off" lever in progression so that the great toe element becomes even more predominant and the small toes even more reduced. There is no doubt that the best foot adapted for terrestrial progression is a foot of few digits, as evidenced by the horse which stands only on its third digit, and Man has come to rely mostly on his first digit, the great toe for this purpose.

In four-footed monkeys, the mid-tarsal joint is flexible to allow the heel to be raised while the great toe and digits retain their grasp. In the bipedal small anthropoids this joint becomes somewhat less flexible, while in the great anthropoids the joint allows of eversion and inversion though there is still no longitudinal plantar arch. This arch, which first appears in the gorilla, is due to the weight of the body being applied on the outer margin of the inverted foot so that the inner margin of the tarsus assumes a postural function. Continued inversion raises the inner margin of the tarsus and the metatarsal element of the great toe which soon becomes incorporated with those of the others so leading to the formation of a true longitudinal plantar arch: the grasping anthropoid foot is thus converted into the supporting human foot. The longitudinal plantar arch has great functional importance and its collapse, by a breakdown of the mid-tarsal joint, leads to the common condition of flat foot.

Muscular changes are associated with these skeletal ones. There is a change in the size and attachment of the muscles of the great toe but there is only one new muscle formed ,namely a second belly to the flexor hallucis brevis. There are also modifications in the insertion of the foot invertors, the appearance of a new evertor *(Peroneus tertius)*, while the plantaris become cut off from the plantar aponeurosis by the heel.

The human child attains its fully erect posture 14 to 15 months after birth — it usually stands unsupported by the age of 14 months and walks unaided at 15 months. Subsequent maintenance of a good erect posture is influenced by cultural aspects of training, background and environment. Posture is also to a large degree influenced by the inner emotions and it has been said that "we stand and move as we feel."

Man's upright posture brings with it certain serious mechanical drawbacks. I have already referred to the weakening of the pelvic floor with the possibility of prolapse, the breakdown in the defence mechanism of the groin with the formation of hernia, and the disruptions of the longitudinal plantar arch and the formation of flat-foot. I may also mention the possibility of dislocation of the base of the vertebral spine (spondylolisthesis), lateral curvature of the spine (scoliosis), drooping of the shoulders with pressure on the brachial plexus, and hallux valgus (the so-called "bunion" disease). To these must be added herniations of the intervertebral discs of the spine ("slipped d'sc") which often accounts for cases of so-called sciatica, lumbago and backpain.

The erect posture of Man marks him off from other animals, lifting him physically above the ground. It affords him improved and new forms of vision, the possibility of speech and gesture, above all manual dexterity.

Man's erect posture is in fact the symbol of his biological superiority.

A CASE OF ANO-RECTAL AGENESIS: POSTOPERATIVE COMPLICATIONS

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Summary:

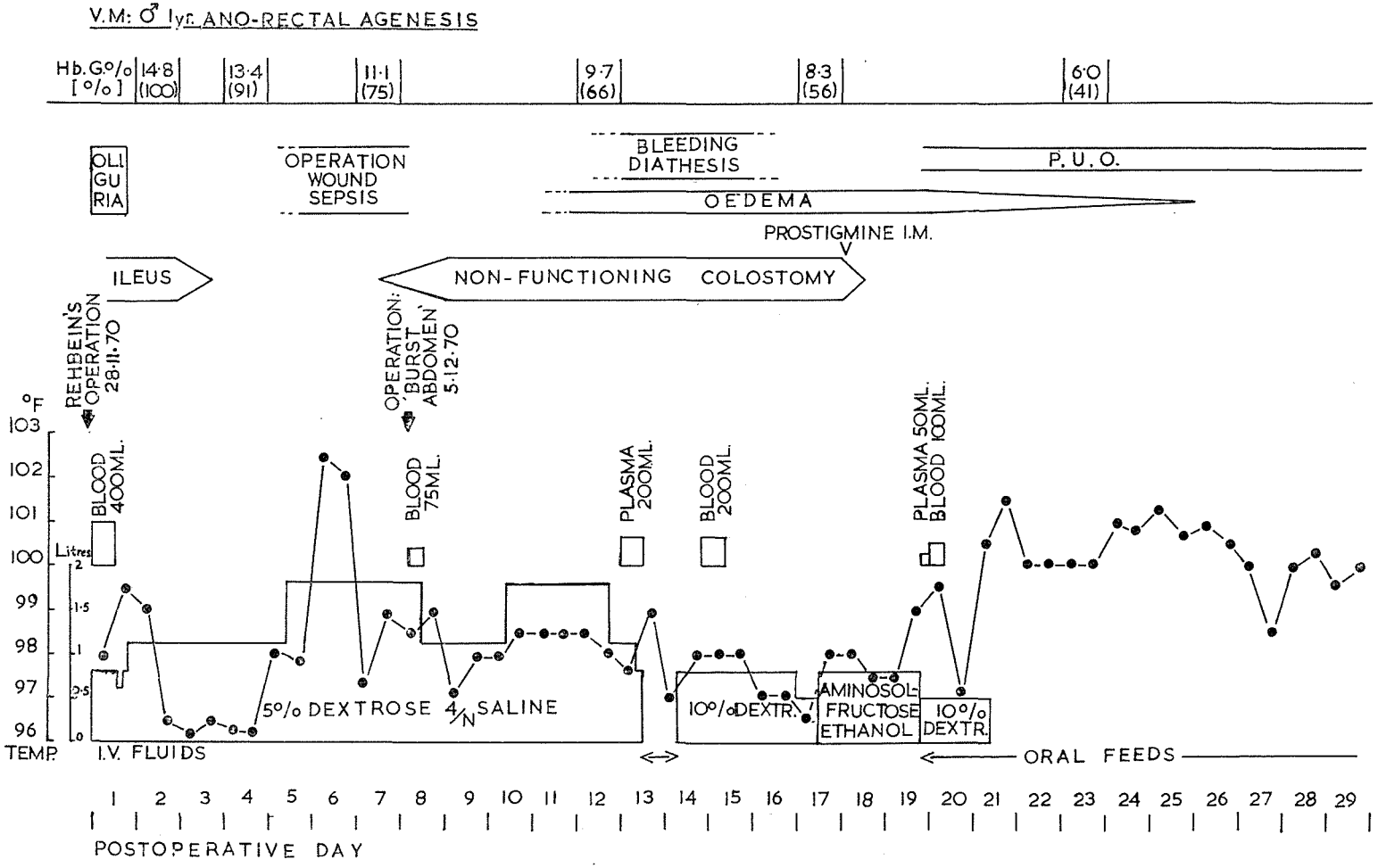
An analysis of the postoperative complications of a case of ano-rectal agenesis is here presented. The multiplicity of factors involved, with special emphasis on protein-calorie malnutrition, together with the importance of team-work in the management of this case, is emphasised.

Case Report:

The child was born at St. Luke's Hospital on 6.11.69 of a para-3 mother, after a normal pregnancy and delivery at term. The birth weight was 3.6 Kg. (8 lbs.). At birth he was found to have 'imperforate anus' of the ano-rectal agenesis type and meconium was seen coming out of the urethra indicating the presence of a fistula. The next day a transverse colostomy was performed (R.A.). The following day he developed generalised twitchings which were easily controlled with paraldehyde and he was put on 'prophylactic' antibiotics. His subsequent progress was uneventful and he was discharged home at the age of 7 weeks weighing 4.9 Kg. (10 lb. 10 oz.).

He was admitted to the children's ward on several occasions under the care of Dr. T. Agius Ferrante: at 16 weeks with gastro-enteritis; at $5\frac{1}{2}$ months with severe anaemia (Hb 7.9 G%) and vomiting; at 9 months with severe anaemia (Hb 8.4 G%) and diarrhoea; and at $10\frac{1}{2}$ months with anaemia (Hb 8.8 G%) and chest infection. At 11 months of age (28/10/70) he was admitted to the surgical ward for further surgery on his ano-rectal agenesis, but operation was postponed because of recurrent upper respiratory tract infections. When 1 year old (28/11/70) and weighing 7.2 Kg. (16 lbs.) the Rehbein pull-through abdomino-perineal operation (Rehbein, 1959) was performed (R.A.) (see fig.). The recto-urethral fistula was tied and the colon, after dissection, was passed through the rectal tube (denuded of its mucosa) and tethered to the perirectal tissues with the end sutured in eversion to the anal margin. The colostomy was not touched at this stage. During and after operation, the child was given 400 mls. of blood and intravenous fluids were continued as 5% dextrose N/4 saline at the rate of 800 mls. per 24 hours. The next day, since he was pyrexial and rales were heard over both lung fields he was started on i.m Ampicillin and Cloxacillin and the drip rate was reduced to 640 mls. per 24 hours. At this time, the urine output was very poor and a few hours later the infusion rate was increased to 1200 mls. per 24 hours and the antibiotics were continued intravenously. His urine output improved and by the second postoperative day he was afebrile and progressing well. The colostomy worked on the third day, but the abdomen was still distended and the child vomited several times. At this time he was given intravenous potassium supplements (14 mEq./lit of K^+) and the gastric aspirate was replaced with equivalent amounts of normal soline via the drip. Serum electrolytes and blood urea were monitored as necessary.

On the sixth postoperative day, the patient's condition deteriorated: he became pyrexial (Temp 102.5° F) and had a sinus tachycardia of up to 200/min; his abdomen was very distended, bowel sounds became infrequent and pus could


V.M: ♂ 1yr. ANO-RECTAL AGENESIS
Hb. G°/o [°/o]
14·8 (100)
13·4 (91)
11·1 (75)
9·7 (66)
8·3 (56)
6·0 (41)
OLIGURIA
OPERATION WOUND SEPSIS
BLEEDING DIATHESIS
P. U. O.
OEDEMA
PROSTIGMINE I.M.
ILEUS
NON-FUNCTIONING COLOSTOMY
REHBEIN'S OPERATION 28·11·70
OPERATION: 'BURST ABDOMEN' 5·12·70
°F
103
102
101
100
99
98
97
96
TEMP.
BLOOD 400ML.
BLOOD 75ML.
PLASMA 200ML.
BLOOD 200ML.
PLASMA 50ML. BLOOD 100ML.
Litres
2
1·5
1
0·5
0
I.V. FLUIDS
5°/o DEXTROSE 4/N SALINE
10°/o DEXTR.
AMINOSOL FRUCTOSE ETHANOL
10°/o DEXTR.
ORAL FEEDS
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29
POSTOPERATIVE DAY

be seen exuding from the operation wound. He was digitalised and the fever and tachycardia settled over the next 24 hours. An erect X-Ray of the abdomen showed fluid levels and on 5/12/70 (i.e. 8 days after the first operation) laparotomy was performed. When the skin sutures were removed it was obvious that the abdomen had "burst" and the small intestine was distended throughout. This was decompressed by a tube passed via the colostomy and the abdomen was closed by through and through tension sutures. Postoperatively following blood transfusion he was continued on intravenous fluids. By the 8/12/70 the colostomy had still not functioned and the child was noted to be developing generalised oedema, though there was no clinical evidence of circulatory overloading and no albuminuria. Serum electrolytes and blood urea were normal but the total serum proteins (4 G%) and, in particular the albumin (2.1G%), were low.

He was given 200 mls. Plasma and Frusemide (Lasix) 10 mg. (1 mg./Kg.) 1M. He was also tried on oral feeds in an attempt to provide calories but he vomited these immediately. By this time, his general state had grossly deteriorated. He was very pale and listless with generalised pitting oedema, distended abdomen, an infected operation wound, poor urine output and a still non-functioning colostomy. He also had numerous ecchymoses and bled easily from venepuncture sites and from the tension sutures. On 12/12/70 he was given more blood, daily i.m. injections of Vitamin K were started and IV fluids were recommended as 10% dextrose. On 14/12/70 because of shortage of suitable peripheral veins, a 'cut-down' was performed on the left long saphenous vein in the groin and a 12 inch nylon IV cannula was inserted via the femoral vein up into the inferior vena cava. Through this he was given a high-calorie solution of Aminosol-Fructose-Ethanol (Aminosol-Vitrum).

Meanwhile, the colostomy had still not functioned 10 days after the second operation and Prostigmine 0.2 mg. 1M. was given. About 4 hours after this the colostomy started functioning. The aminoacid solution was discontinued after 3 days. Afterwards, while the child was being given more plasma, he was reported to have collapsed, becoming pale and limp, with rapid respirations. The plasma was stopped and blood, hydrocortisone and oxygen were given. His general condition slowly improved and by the next day (17/12/70) he was well enough to be started on 10% dextrose by mouth and the IV fluids were reduced in amount. The oedema had by now greatly improved and was limited to the lower limbs and the bleeding diathesis had resolved. On 18/12/70 he was started on milk feeds and solids together with a multivitamin preparation. He then became febrile and had loose stools and was treated with a short course of oral Sulphaguanidine and Streptomycin suspension (Guanimycin). The diarrhoea settled, but the pyrexia persisted for 2 weeks before it resolved spontaneously without chemotherapy. By the 23/12/70 the oedema had virtually disappeared and the main problem was then one of severe anaemia (Hb 6.0 G%). He was treated with intramuscular, and later oral, iron and on the 8/1/71 a repeat Hb was 13 G%.

On 18/12/70 it was noticed that the child could not bear weight on his right leg, keeping it flexed at the hip. X-Ray showed changes suggestive of metaphysitis of the right femur. This however settled within a few days with simple passive movements of the hip joint.

Following this, progress was uneventful and the child underwent two further operations under general anaesthesia. On 18/2/71 the anal orifice was dilated and on 8/3/71 the colostomy was closed. The postoperative periods were both smooth and the child was discharged home well on the 6/4/71 with a Haemoglobin of 13.7 G%. He is to be re-admitted in a few months' time for trimming of the rectal stump.

Comments:

(1) Postoperative oliguria

This was, in part due to the fact that the child initially received less than the

basal daily fluid requirements for his weight, i.e. 640 to 800 mls. rather than 1200 mls. The blood urea was however never elevated, showing that good renal function was maintained throughout the intra- and post-operative periods. The oliguria was probably largely a manifestation of the normal postoperative response to surgical stress which causes increased antidiuretic hormone and corticosteroid release with water and salt retention. Marked oliguria is nevertheless often a worrying feature in an ill child and a useful test is to increase the rate of infusion over half an hour and to observe its effect on the urine output. This was done in our patient with a brisk diuretic response.

It must also be remembered that in these patients additional fluid and solute are lost via the skin and the respiratory tract, (especially in the presence of pyrexia) and via the gastro-intestinal tract through gastric aspiration, vomiting and colostomy secretions. In the presence of ileus one must also make allowances for water and solute sequestered in loops of dilated bowel. All this requires careful collection and measurement of all losses and meticulous input-output charting on a fluid-balance sheet.

(2) Non-functioning Colostomy:

The colostomy failed to function at all for about 10 days after the second operation, though bowel sounds could be heard on and off on several occasions. This was probably due to a multiplicity of factors among them hypokalaemia, oedema of the bowel wall, wound infection and the poor nutritional status of the child. Serum potassium level was normal but as this is a poor index of the state of the intracellular potassium, the child was nonetheless given K supplements intravenously. Cholinergic drugs to stimulate intestinal paristalsis are rarely indicated because other measures especially gastro-intestinal suction and proper hydration usually suffice. In this patient, the colostomy started working about 4 hours after administration of Prostigmine.

(3) Oedema:

This was not an unexpected complication as the child had been on a grossly inadequate protein-calorie intake during his first 12 postoperative days. A 7.2 Kg. (16 lb.) child in good health would require a basal intake of about 800 calories (100 cals/Kg.) and 24G protein (3G/Kg.) per day. The patient had 5% dextrose N/4 saline as basic intravenous fluids supplying him with 240 to 360 calories per day depending on the amount of fluid intake. The only source of protein was two blood transfusions (given on two separate days) which supplied about 14G protein in all. The oedema was therefore due to protein-calorie malnutrition causing hypoproteinaemia. Moreover, the possibility that the child may have been hypoproteinaemic before operation is unlikely because he had a normal haemoglobin. Plasma was given, but this is only of limited benefit to maintain the intravascular osmotic pressure, thereby slowing the progress of the oedema. Moreover, the calorific value of plasma is only 20 calories per 100 ml. which is clearly inadequate. For these reasons it became obvious that the child needed urgent parenteral nutrition and until the Aminosol-Fructose-Ethanol solution was made available to us we gave 10% dextrose (supplying about 320 calories per day) via a small peripheral vein.

Aminosol contains in the physiological L-form, all the 8 essential and 10 no-essential aminoacids. An absolutely vital factor in the metabolic utilisation of nitrogen is that adequate non-protein calories must be given simultaneously (Michener and Law 1970). These are provided by fructose and ethanol, making up the high-calorie solution (about 875 calories per litre). As this is hypertonic and irritant to vessel walls, a venous catheter was threaded up the inferior vena cava and the solution was given at the rate of 800 mls. per day (100 ml/Kg/day) for three days. Further plasma, blood and 10% dextrose were then given and over the next few days the oedema became less obvious and after a week it virtually disappeared. Once oral feeds are re-established in such cases, rapid improvement usually follows.

(4) Bleeding Diathesis:

This was probably due to several factors. Non-availability of protein for synthesis of the various coagulation factors and impaired liver function with failure of synthesis of the Vitamin-K-dependent factor (II, VII, IX, X) were perhaps the two most important mechanisms. It is also likely, that Vitamin K itself may not have been readily available for absorption from the large bowel because the patient had been on broad spectrum antibiotics (Ampicillin and Cloxacillin) for some time before. On 14/12/70 the platelet count was 112,000/cu.mm., so that thrombocytopenia may have been an additional factor. Coagulation studies were not performed. The patient was treated with plasma, blood transfusions and i.m. Vitamin K_1 injections and the bleeding tendency settled after about 5 days.

(5) Anaemia:

The child had previously been admitted to hospital with moderately severe anaemia but his haemoglobin levels on the second and fourth postoperative days were normal. The Hb dropped to 11.1 G% around the time when it was obvious that the operation wound had gone septic. The film later on showed microcytosis and hypochromia and the anaemia was most likely due to a combination of infection, iron deficiency and protein-malnutrition. Also, repeated blood sampling by venepuncture can, in a child of this age, amount to quite a considerable degree of blood loss. Using microtechniques, needing as little as 0.1 ml. capillary blood (obtained by the heel-prick method) would avoid this complication.

By the 27/12/70 the child's haemoglobin had fallen to 6.0 G% and therapy was started with intramuscular and later oral iron. The poor initial response to this was probably due to the concomitant presence of infection which is known to interfere with incorporation of iron into the haemoglobin molecule.

(6) Pyrexia of unknown origin:

The cause of this fever remained obscure. There was always the great risk that the operation wound might become 'septic' because of difficulty in separating it from the colostomy area. Repeated swabs from the wound site grew mixed flora including Proteus and Pseudomonas organisms. Blood culture (17/12/70) and urine culture (22/12/70) grew similar organisms, but the significance of these results was doubtful because of the close proximity of the colostomy to the operation wound, to the I.V. cut-down at the groin and to the genital region, in a small child. Although urinary tract infection, or even 'low-grade' septicaemia via the venous catheter seemed likely possibilities at the time, it was decided to withhold antibiotic therapy as apart from his fever the patient was progressing very satisfactorily. The fever finally settled after 14 days.

Conclusion:

The postoperative care of a seriously ill child who has undergone major surgery and may be suffering from multiple complications, necessitates close liason between the surgeon, the paediatrician and the laboratory and nursing staff. It is clear from the comments about this case that the utmost attention to detail is crucial in the management of such cases.

Acknowledgements:

We thank the resident house-officers and the ward sister and her staff in W.S.2. for their care and attention in looking after this patient. We are also grateful to the David Bruce Military Hospital, Mtarfa, for the supply of Aminosol (Vitrum) and to Miss R. Jones of the Medical School for secretarial help.

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HOSPITAL MORTALITY IN MYOCARDIAL INFARCTION

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The World Health Organisation (1969) reported that ischaemic heart disease has reached enormous proportions, striking more and more at younger subjects. It was claimed that in the coming years, it will result in the greatest epidemic mankind has faced unless this trend is reversed by concentrated research into its cause and prevention. A Mayo Clinic study of the Rochester population of 30,000 in which there is a 73% necropsy rate, showed that coronary heart disease was the cause of death in 4 out of 10 men and in 2 out of 10 women (Spiekerman *et al.*, 1962). In Malta deaths from ischaemic heart disease in the years 1968 and 1969 accounted for 19% of all deaths. It is moreover the general impression amongst Maltese physicians that the incidence of ischaemic heart disease is increasing.

Acute myocardial infarction is an extremely common emergency in general hospitals with a high incidence of acute medical admissions. It is now generally agreed that the introduction of coronary care units, by providing facilities for early detection of arrythmias and emergency resuscitation, has contributed substantially to lower the hospital mortality from myocardial infarction. In the absence of such a unit, the usual hospital mortality is in the region of 30%. The purpose of this paper is to review the cases of myocardial infarction admitted into a medical unit of St. Luke's Hospital in the years 1968 and 1969 as well as to assess the factors affecting the hospital mortality in this group of patients.

Material

One hundred and thirtyfour patients with myocardial infarction were admitted into the unit. The diagnosis was considered established if (1) pathological Q waves appeared on the electrocardiogram, accompanied by an elevation in the S-T segment and a subsequent inversion in the T wave, or (2) there were changes in the S-T segment and T wave suggestive of infarction or there was bundle branch block accompanied by a significant and transient rise in the serum aspartate aminotransferase.

Most of the patients received oxygen for the first 48 hours. Pain was relieved by intramuscular injection of 100 mgm. pethidine or 15 mgm. morphine sulphate. In patients with very severe pain, intravenous morphine sulphate was sometimes resorted to. Anticoagulants were not routinely given. They were used in male patients under the age of 50 and in those patients with associated atrial fibrillation, congestive heart failure or evidence of venous thrombosis; intravenous heparin was used in the first 48 hours, whilst oral phenindione in 1968 and warfarin in 1969 were given on admission and continued for 6 weeks, the dose being adjusted to give a prothrombin ratio of 2-2.5/1. Thirtysix per cent of the patients had in fact received anticoagulants. Left ventricular failure was treated with digoxin and diuretic therapy; and in the absence of pacing facilities, steroids in doses of 60 mgm. daily were started on the development of 2nd degree heart block or complete heart block.

Results

The age and sex distribution of the patients are shown in *Table I.* The age of the patients ranged from 28 years to 82 years. There were 103 men with an average age of 58 years, whilst the mean age for the 31 women was 65 years.

TABLE I
Age & Sex of Patients

Age: (Yrs.)	Men		Women	
	1968	1969	1968	1969
20 - 30	—	1	—	—
31 - 40	3	3	—	—
41 - 50	9	14	1	1
51 - 60	16	16	2	7
61 - 70	13	16	5	4
71 - 80	3	7	5	5
80 -	—	2	1	—
Total:	44	59	14	17
Average age:	58 yrs.		65 yrs.	

As determined by the electrocardiogram, there were 67 cases of anterior infarction, two of these combined with posterior infarction. Fortythree myocardial infarcts were posterior and 24 intramural and subendocardial *(Table II).* In the whole group, there were 2 cases of acute complete heart block associated in one case with anterior infarction and in the other with posterior infarction.

TABLE II
Site of Infarction

Anterior	67
Posterior	43
Intramural & Subendocardial ...	24

Chest pain with or without shock was the presenting feature in 115 cases (85%). Heart failure was the presenting symptom in 15 cases and syncope in 4 *(Table III).* The patients presenting with heart failure had a mean age of 67 years as compared

TABLE III
Mode of Onset

1. Chest Pain	—	115 cases
2. Syncope	—	4 cases
3. Heart Failure	—	15 cases

TABLE IV
Incidence of previous infarction

First	—	114
Second	—	19
Third	—	1

to 60 years for the whole group. There was a history of previous myocardial infarction in 19 patients; in one instance, the episode which necessitated hospital admission was the third myocardial infarct *(Table IV).* Thirtyeight patients gave a history of hypertension. There were on the other hand 28 diabetic patients. In 2 patients, diabetes was first recognised at the time of the myocardial infarct *(Table V).*

TABLE V
Associated Diseases

I *Hypertension*
30 out of 103 male patients
8 out of 31 female patients

II *Diabetes Mellitus*
16 male patients
14 female patients

One of each sex diagnosed at time of infarction.

The time of admission into hospital after the onset of chest pain was worked out in 111 patients. Thirtyone per cent of the patients were in hospital within 6 hours of the onset of pain whilst 74% were admitted within 24 hours *(Table VI).* Two patients developed myocardial infarction in hospital whilst receiving treatment for other conditions.

The monthly distribution of cases admitted to the unit as shown in *Fig. I.* The highest admission rate occurred from May to July. The mortality rate for the period or admission to hospital was 19.4%. The time of death in the 26 pa-

TABLE VI
Time of admission after onset of pain

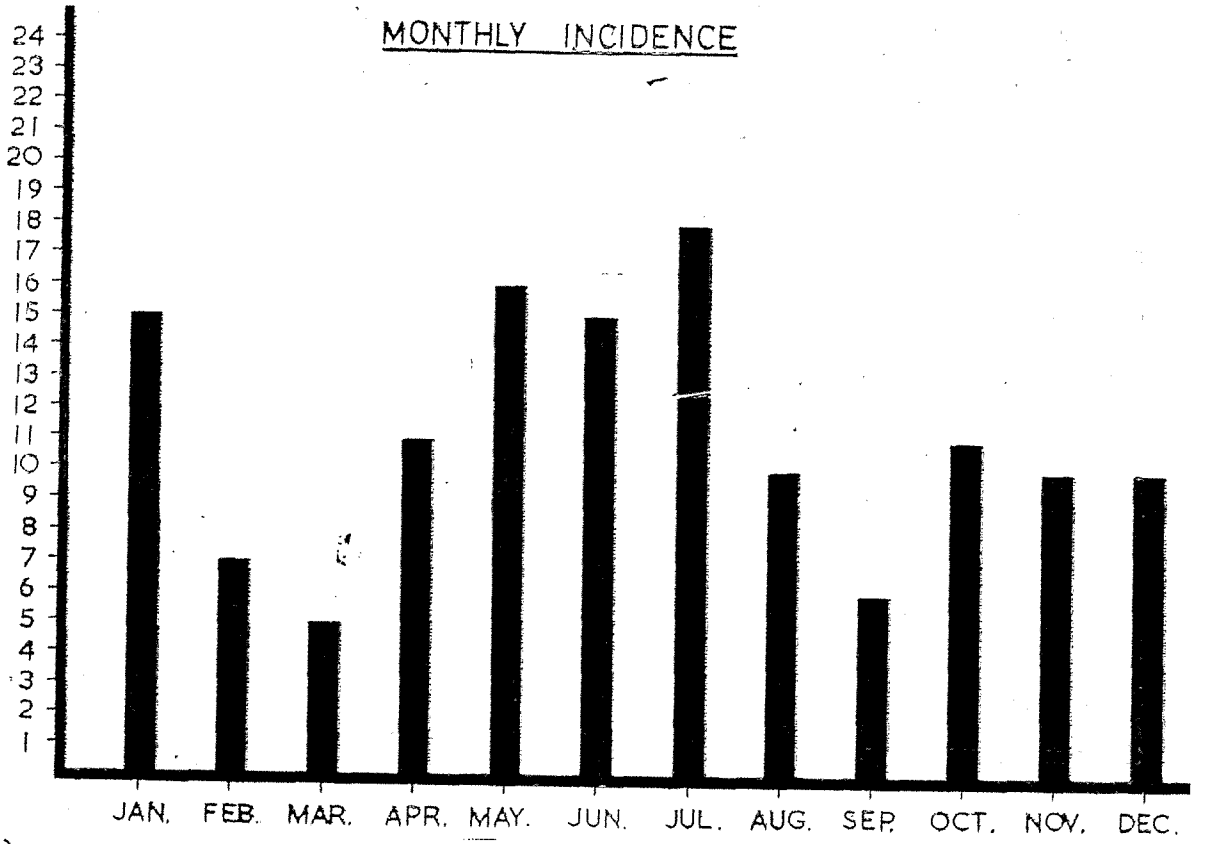
Time (hrs.)	*No.*
0 - 6 hrs.	34
7 - 12 hrs.	25
13 - 24 hrs.	24
25 - 48 hrs.	14
48 hrs. +	14

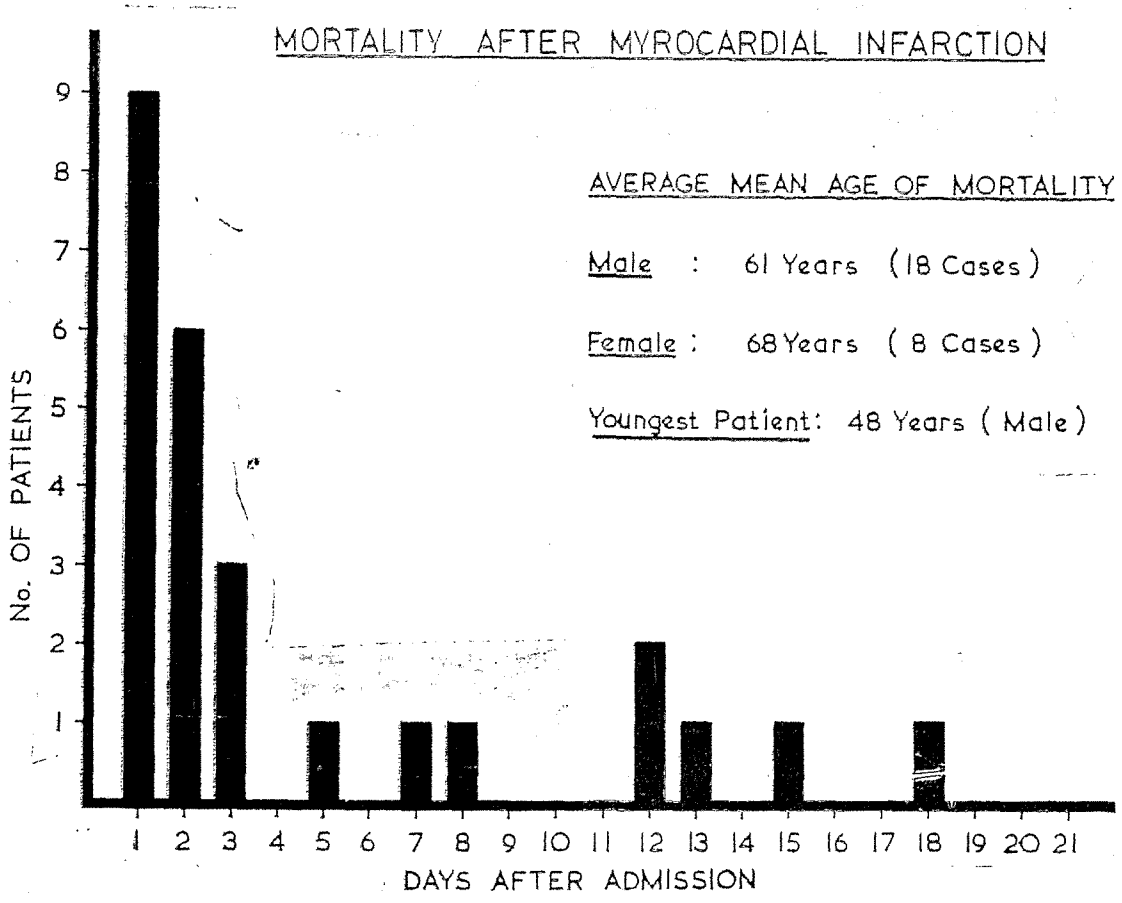
tients is shown in *Fig. II.* Nine of the 26 deaths occurred within the first 24 hours and by 48 hours 15 deaths had taken place with an additional 6 deaths during the remainder of the first week. The average age of the 18 fatal male cases (mortality 17.5%) was 61 years compared to 68 years for the 8 female patients (mortality 26%).

Discussion

A number of factors influence the prognosis in myocardial infarction. It has long been realised that such factors as shock, heart failure, arrythmias, previous infarction, diabetes mellitus and hypertension as well as the age and sex of the patients influence the prognosis. (Honey and Truelove, 1957). It has been established that diabetes mellitus is prevalent in Malta and that it is of the obese middle-age onset type (Zammit Maempel, 1965). A recognised feature of ischaemic heart disease is the unusually high proportion of women affected. This is reflected in the fact that 45% of the female patients as compared to 15.5% of the males were diabetic. It has moreover been suggested that among diabetics with long-standing disease, a higher prevalence of ischaemic heart disease exists in late onset mild diabetics than in early onset insulin dependent subjects who had attained the same age group (Weaver *et al.*, 1970).

Hospital mortality from myocardial infarction, irrespective of the presence or absence of coronary care facilities, is in-





fluenced by such factors as the average age of the hospital coronary patient population and the speed of admission. The effect of age grouping in mortality has been recognised (Honey and Truelove, 1957). As a matter of fact, the mortality of some American county hospitals (Griffith *et al.*, 1962) with a relatively older group of patients was higher than that in the Veteran hospitals (Beard *et al.*, 1960) where the patients are younger. This rise in mortality with increasing age is demonstrable in this study.

Another important factor is the time of admission after onset of symptoms. A high proportion of patients admitted during the first few hours of the illness, when the risk of death is greatest, will increase the overall mortality, whereas admitting patients several hours after infarction produces a lower mortality during the period of admission (Lown *et al.*, 1967). Indeed 40% of deaths from acute myocardial infarction occur within 1 hour of the onset of symptoms (McNally and Pemberton, 1963); whilst in men of middle-age and younger, 63% of deaths occur within 1 hour (Bainton and Peterson, 1963). In Edinburgh, the mortality of cases admitted after 12 hours was 11% as compared to 19% in those admitted within 4 hours (Lawrie *et al., 1967).* This is reasonable for cardiac arrythmias, which are most frequent soon after the infarct, and are a common cause of death within a few hours of the myocardial infarct. In fact Stock *et al.*, (1967) found an overall incidence of arrythmias in 76% of patients. Indeed it was the appreciation of the high incidence of arrythmias during the first 48 hours of myocardial infarction and the improved techniques of resuscitation that led to the creation of coronary care units. There is no doubt that the main contribution of

these units to the lowering of the hospital mortality from myocardial infarction from 30% to an average of 15-18%, has been the prevention of the arrythmic deaths.

The mortality from myocardial infarction in various hospitals prior to the establishment of coronary care units has varied from 26% to 52% (Honey and Truelove, 1957; Beard *et al.*, 1960; Griffith *et al.*, 1962; Brown *et al.*, 1963; Restieaux *et al.*, 1967; Norris *et al.*, 1968; Herndorn, 1969; Hofvendahl *et al.*, 1969; Bloomfield *et al.*, 1970). The mortality in the present series was 19.4%. This wide range of difference in mortality must surely reflect differences in the age of patients and speed of admission into hospital rather than differences in the standard treatment. In Hofvendahl's series, where the hospital mortality was 35%, the average age of male and female patients was 67 years and 71 years respectively as compared to 58 years for Maltese male patients and 65 years for Maltese female patients. Moreover 55% of the Swedish patients were in hospital within 6 hours of onset of symptoms as compared to 31% of the Maltese patients.

All studies on myocardial infarction have confirmed the fact that most of the hospital deaths occur in the first 48 hours. In the present series, 34.6% of all deaths occurred in the first 24 hours; this is very similar to the figure of 31% found by Norris *et al.*, (1968) in New Zealand. Results of attempted resuscitation in cases of cardiac arrest after myocardial infarction in general medical wards are poor when compared to ones obtained in coronary care units. Survival rates in general medical wards have varied from 5% to 10% (Nachlas and Miller, 1965; Stennler, 1965; McNicol, 1966); in the present study it was 5%. However in coronary care units, there is a 40% to 54% survival rate (Julian *et al.*, 1964; Day, 1965). Wherever coronary care units have been introduced, the mortality from acute myocardial infarction has been halved. Moreover in Belfast since mobile coronary care units have been introduced in order to put myocardial infarction patients as quickly as possible under coronary unit facilities, the mortality has fallen to 11% (Pantridge, 1970).

Studies from different parts of the world have demonstrated the value of coronary care units for acute myocardial infarction in hospital patients; and there is no doubt that our mortality would have been lower had such facilities been available. However an interesting development has been the suggestion by Mather (1970) that mortality from myocardial infarction in patients treated at home may not be higher than in those treated in hospital. In fact, his mortality for patients treated at home was 11%. He went on to suggest that home care was suitable for many patients. However hospital care would always be needed for those patients with arrythmias and those where home care is not possible. In view of the cost involved in treating *all* patients with myocardial infarction in coronary care units, it is very important that the Bristol findings be confirmed by further studies. Malta with its small size and stable population, is an ideal setting not only for establishing an ischaemic heart disease register but also for a comparative study of the value of home and hospital care in acute myocardial infarction.

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ISOLATED RIGHT VENTRICULAR HYPOPLASIA WITH ATRIAL SEPTAL DEFECT

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Isolated Hypoplasia of the right ventricle is a rare congenital cardiac anomaly which has been infrequently reported in the literature. Less than fifteen cases have so far been recorded. We describe here the clinical, haemodynamic and angiographic findings in two cases, and briefly review the literature.

Case Reports

Case 1

J.F. was the second child of healthy parents; she was a full term normal hospital delivery, following a normal pregnancy. There was no difficulty in onset of respiration. B.W. 5 lb. 13 oz. She had two cyanotic attacks on the first day and was noted to be cyanosed on crying during the first week of life. On general examination she was a peculiar looking baby with a small head (circumference 12½"), receding brow, and long thin limbs with long fingers and toes. There were no heart murmurs and the peripheral pulses were normal. X-ray of the chest was normal and the ECG showed left ventricular hypertrophy. After the first day she had no further cyanotic attacks.

She subsequently thrived, but showed slight cyanosis at rest and a heart murmur was first noted at 10 months of age.

She was referred to the Brompton Hospital and at 2 years of age was admitted for further investigation. Her general condition was good. There was probable cyanosis at rest, which became obvious on crying; there was no differential cyanosis. The peripheral pulses were normal. The blood pressure was 80 mm Hg by palpation in upper limbs. The fingers and toes were clubbed. There was no chest bulge and no thrill. The heart was quiet with a grade of 1-2/6 ejection murmur best heard at the second left intercostal space. The second sound was single. The lungs were clear on auscultation and the liver was not palpable.

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Table 1. Haemodynamic data of Case 1 and Case 2

	CASE 1		CASE 2	
	Pressure mm.Hg.	O_2 Satn. %	Pressure mm.Hg.	O_2 Satn. %
Mixed Venous	-	58		49
Right Atrium	a=6 v=5	56	a=7 x=4 v=5 y=4 mean=5	47
Right Ventricle	11/0-5 presystolic wave=6	56	13/2-6 presystolic wave=7	45
Pulmonary Artery	11/5	56	-	-
Wedge	mean=7		-	-
Pulmonary Vein	-	96	-	98
Left Atrium	mean=2	87	a=4 x=2 v=3 mean=3	75-84
Left Ventricle	70/0-3	81-90	65/6-7	73-80
Axillary Artery	75/55	81	63/46	80
QP	2.4 L./min./Sq.M.		1.4 L./min./Sq.M.	
QS	3.3 L./min./Sq.M.		2.2 L./min./Sq.M.	
QP/QS	0.73		0.64	

Investigation: Hb 14.6 g%, P.C.V. 53%. Chest X-ray showed slight to moderate cardiomegaly with some probable reduction in lung vascularity. E.C.G. Axis + 100° and an adult R/S pattern, indicative of mild left ventricular hypertrophy. A clinical diagnosis of tricuspid atresia was made.

Cardiac catheterization: (right axillary approach) was carried out under general anaesthesia, breathing 25% oxygen. Both right and left pulmonary arteries were entered. There was a presystolic wave in the R.V. pressure tracing equal to the right atrial 'a' wave and a narrow ejection peak of the right ventricular pressure curve. *(Table 1)* The presystolic wave was also seen in the pulmonary artery pressure curve. The left atrium was entered from the right atrium, and the left ventricle from the left atrium. Oxygen saturation data revealed systemic arterial desaturation (81%) and a right to left shunt at atrial level.

Selective angiocardiography, with injection of 75% Triosil into the right atrium showed opacification of both the left atrium and an anteriorly placed right ventricle from which arose a normally situated pulmonary artery. The pulmonary valve was not well seen. *(Fig. 1)* Injection of contrast medium into the left ventricle showed no abnormality of this chamber or of the aorta, and no ventricular septal defect *(Fig. 2).*

Case 2

P.M. The mother had taken Nitrazepam in the last 4 months of pregnancy, which had been otherwise normal. He was the second of dissimilar twins, delivered by breech with forceps application to the after-coming head, at 39 weeks' gestation (pitocin drip for prolapse of cord). Birth weight 7 lb. His condition was poor at birth and he was placed in an incubator for three days. Cyanosis and a heart murmur were noted during the first few days. However, he subsequently thrived and development was normal.

A brother aged 6 years, a sister aged 8 years, and another brother and sister both aged 9 years (twins), besides his twin brother are all normal. His parents are healthy.

He was admitted to the Brompton Hospital for further assessment when aged 6 months. On examination he looked well with height (64 cm) and weight 6.300 kg) both around the 10th percentile. He was mildly cyanosed at rest but there was no clubbing. His peripheral pulses were normal. There was no heart murmur and the second sound was single and of normal intensity. The lungs were clear to auscultation and the liver was not enlarged. There was no other abnormality on routine examination. Relevant *investigations* showed Hb 16.5g%, P.C.V. 54 %. Chest X-ray showed normal size heart with diminished pulmonary vasculature. E.C.G. showed an indeterminate axis with normal P waves; adult R/S pattern indicative of left ventricular hypertrophy. A clinical diagnosis of tricuspid atresia was made.

At *cardiac catheterization* (Dr. G. A. H. Miller) the systemic saturation was 80%. The atrial septum was crossed by catheter and there was a right to left shunt at atrial level. There was again a presystolic wave transmitted to the R.V. The pulmonary artery was not entered. *(Table 1).*

Selective angiocardiography with injection of 75% Triosil into R.A. showed passage of contrast medium into a smooth-walled small anterior right ventricle, and thence into the pulmonary artery. The right outflow tract was not well seen. There was also some opacification of the left atrium. Injection of contrast medium into the left ventricle demonstrated no abnormality.

Discussion

Taussig (1936) drew attention to the association between defective development of the right ventricle and anomalous tricuspid and pulmonary valves. However, isolated hypoplasia of the right ventricle in the absence of valve atresia is very rare. The condition may be associated with hypoplasia or stenosis of the tricuspid valve, and an atrial septal defect or a patent foramen ovale is often present.

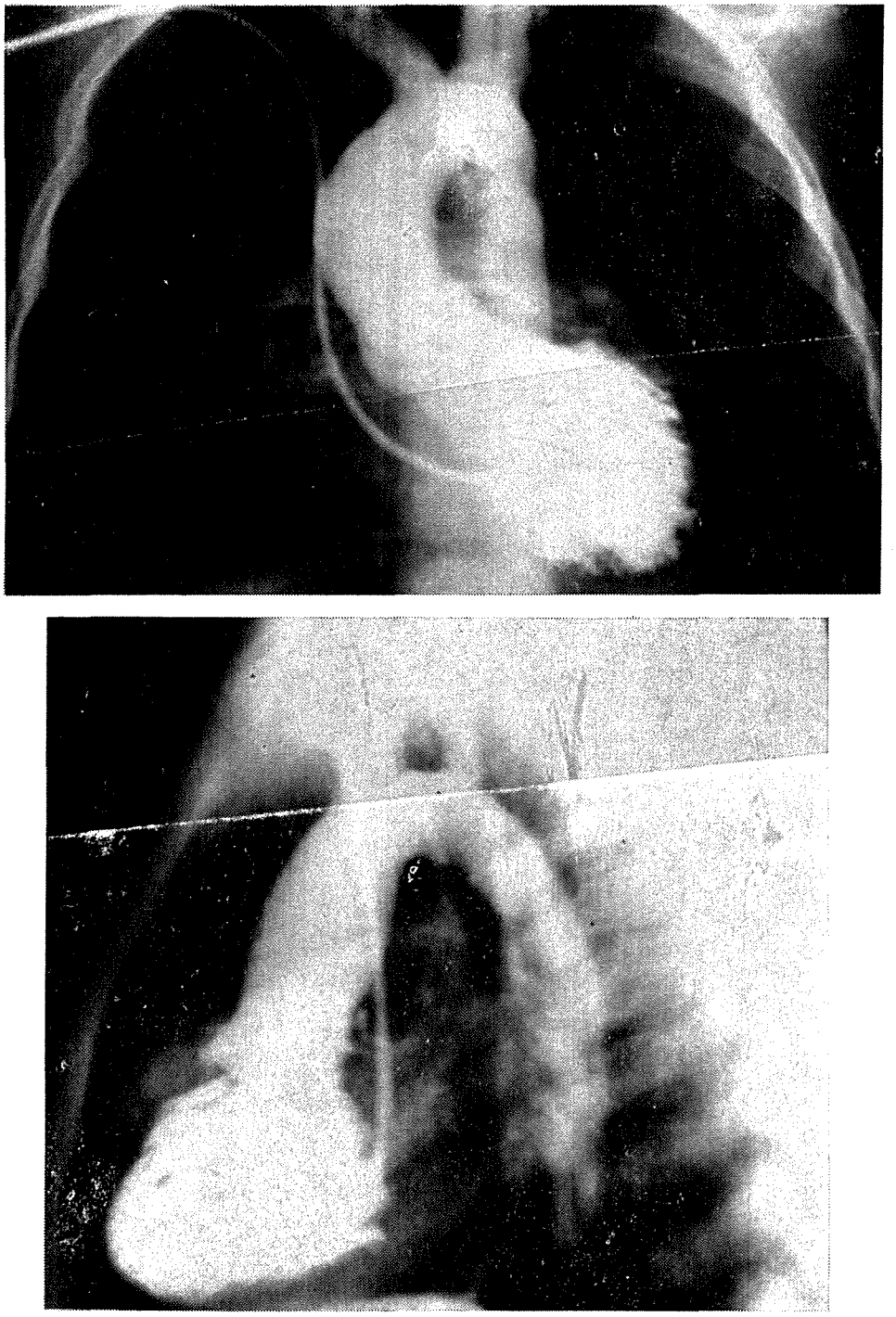

Fig. 1

Case 1

Angiogram with injection of contrast medium in the right atrium. There is opacification of right and left atrium, right ventricle, pulmonary artery and aorta.

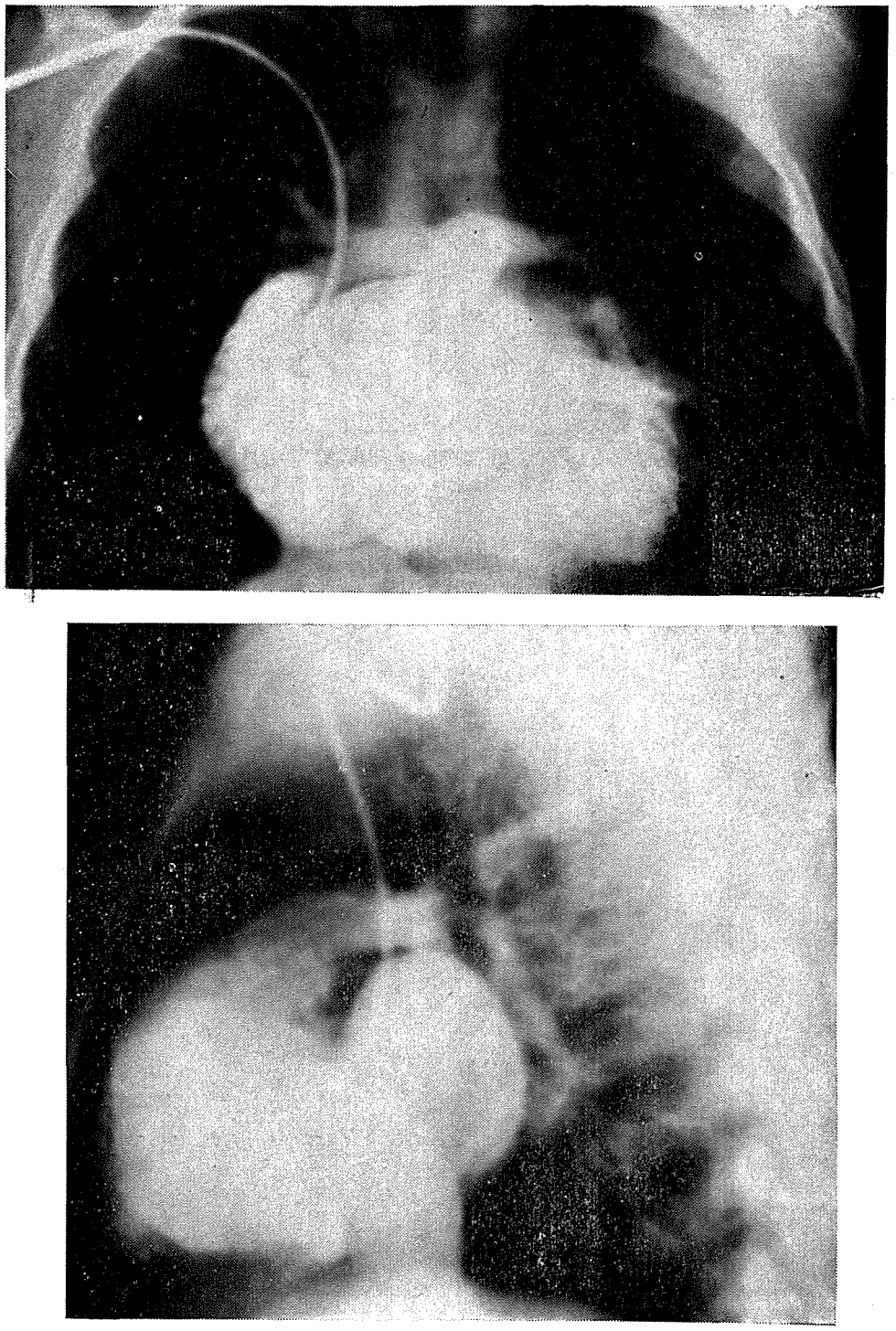

Fig. 2

Case 1

Angiogram with injection of contrast medium in left ventricle. Normal appearances.

Cooley *et al.* (1950) diagnosed isolated hypoplasia of the right ventricle on angiographic appearances, which was confirmed at necropsy. Gasul *et al.* (1959) diagnosed a similar case at thoracotomy for a Glenn procedure on a child with suspected tricuspid stenosis. Medd *et al.* (1961) gave the detailed anatomical findings at necropsy in two siblings with isolated hypoplasia of the right ventricle and tricuspid valve. Sachner *et al.* (1961) described the clinical and haemodynamic features in three adults with this condition, all in the same pedigree, and presenting with progressive right heart failure. They also gave the necropsy findings in a two month old infant. Fay and Lynn (1963) reported a six year old with hypoplastic right ventricle associated with atrial septal defect and supravalvar pulmonary artery stenosis; there was marked clinical improvement following anastomosis of the right pulmonary artery to the superior vena cava (Glenn procedure). Stoerner and Apitz (1965) gave the clinical, haemodynamic and angiographic findings in a 4 year old boy with this anomaly, a Blalock-Taussig anastomosis was performed but he died a few hours after operation. Raghib *et al.* (1965) reported a male infant with hypoplasia of the right ventricle and tricuspid valve, and Davachi *et al.* (1967) described this patient's sister who died with an identical malformation. Overy *et al.* (1966) recorded a case of anomalous systemic venous drainage with hypoplasia of the right ventricular myocardium and right to left shunt at atrial level.

Aetiology

The aetiology is obscure. A familial factor has been prominent in some reported cases (Sachner *et al.*, 1961; Medd *et al.*, 1961; Davachi *et al.*, 1967). Wood (1958) noted that congenital heart disease recurring in more than one member of a family is usually of the same type. The siblings and parents of the cases reported here have no clinical evidence of congenital heart disease. A primary failure of development of the muscle of the free wall of the right ventricle has been postulated (Medd *et al.*, 1961). Overy *et al.* (1966) suggested that deviation of blood from SVC which normally flows to the RV in foetal life (as in their case of anomalous systemic venous drainage to left atrium) might result in underdevelopment of the right ventricular myocardium. This is similar to LV hypoplasia which occurs when premature narrowing or closure of the foramen ovale results in reduction of flow into the left ventricle (Lev *et al.*, 1963). The case reported by Cooley *et al.* (1950) was attributed to absence of the right coronary artery, though this was found to be normal in others. In Uhl's case (Uhl, 1952) there was almost total absence of the myocardium from the right ventricular wall, with marked dilation of the chamber, which contained a large laminated mural thrombus; microscopic examination of the right ventricular wall showed epicardium and endocardium adjacent to each other with no intervening cardiac muscle; the coronary arteries were normal. It is here suggested that the determing factor for development of the myocardium is the blood flow into the chamber during foetal life rather than the coronary artery supply.

Clinical Features

The clinical features resemble those of tricuspid atresia. Cyanosis is a constant feature and is often recorded as being present from birth. Heart murmurs are usually absent in the straightforward case of hypoplasia of the right ventricle with a patent foramen ovale or ASD, and when present an associated anomaly such as pulmonary stenosis or frank tricuspid incompetence should be suspected. The E.C.G. typically shows left axis deviation but the axis was + 110° in one case of Medd *et al.* (1961). The praecordial lead pattern is that of left ventricular dominance, and there is usually less positive deflection of the QRS complex over the right chest leads than one would expect. Indeed ,if in the presence of signs of pulmonary stenosis there is little or no evidence of RV activity in the ECG the diagnosis of hypoplasia of the right ventricle should be borne in mind. Bi-atrial or right atrial hypertrophy is a feature, and the

PR interval is usually prolonged due to right atrial dilatation. The chest X-ray shows a normal sized heart with underfilling of the lung fields. The presence of cardiomegaly, without other evidence of heart failure, would be in favour of a diagnosis of Uhl's anomaly (Aplasia of the myocardium of the right ventricle) (Uhl, 1952).

Catheterization and Angiocardiography

At cardiac catheterization the passage of the catheter from RA to RV excludes tricuspid atresia. The tricuspid valve is normally situated. The pressure trace may be similar in pulmonary artery, right ventricle and right atrium, with a presystolic wave, possibly transmitted as far as the pulmonary artery, and a narrow right ventricular ejection peak. A right to left shunt is demonstrable at atrial level. On angiocardiography, injection of the contrast medium in the right ventricle shows this chamber to be normally situated but usually small and the pulmonary artery may be normal or hypoplastic. Injection of the contrast medium in the right atrium will demonstrate the right to left shunt at this level. The left ventricle is normal and the ventricular septum is intact. In Uhl's anomaly the right ventricular cavity is usually enormous, but it may be difficult to distinguish from hypoplasia of the right ventricle if a clot has formed in the right ventricle thus diminishing the size of this cavity. In Ebstein's malformation the RV wall is normal or thin but the ventricular cavity is diminished by a downward displacement of the tricuspid valve.

Both the cases reported here presented with a clinical picture of tricuspid atresia. In both cases the correct diagnosis was suspected during cardiac catheterization from the characteristics of the pressure tracings.

The angiocardiographical appearances in both cases excluded malposition of the tricuspid valve; the size of the cavity of the right ventricle was compatible with hypoplasia of the muscle wall rather than the total aplasia first described by Uhl.

Gasul *et al.* (1959) carried out successful palliative surgery in one case, who survived, anastomosing the superior vena cava to the right main pulmonary artery (Glenn operation). If there is a concomitant atrial septal defect, this should be closed at the same time (Gasul *et al.*, 1966; Overy *et al.*, 1966) but heart failure may supervene. On the whole, treatment of this anomaly has been disappointing.

Acknowledgements

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MEGALOBLASTIC ANAEMIA DUE TO ANTICONVULSANT THERAPY

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Megaloblastic anaemia occurring during prolonged anticonvulsant therapy was first described by Mannheimer *et al.* in 1952. Subsequent studies (Reynolds, 1968; Klipstein, 1964; Malpas *et al.*, 1966) have established that such anaemia is due to a disturbance of folic acid metabolism and may be associated with a variety of anticonvulsants. Large-scale surveys have revealed that serum and red cell folate levels are commonly low in patients on anticonvulsant therapy, but a significant degree of anaemia is rare. According to Wintrobe (1967), less than 100 such patients have been reported. A case of severe megaloblastic anaemia complicating therapy with phenobarbitone and diphenylhydantoin sodium (phenytoin) is here described.

Case Report

A 41-year old married woman was admitted to St. Peter's Hospital, Chertsey, Surrey, in November 1970, complaining of increasing tiredness, shortness of breath and ankle oedema. Since the age of 10 she had been suffering from grand mal epilepsy which had been treated with phenobarbitone 60 mg. t.d.s. and phenytoin 100 mg. t.d.s. On this regime she had approximately one fit every two months. She was one of a pair of identical twins, and her sister had also developed epilepsy at the same age. The patient had undergone a cholecystectomy for gall stones in 1963, and had been successfully treated for iron deficiency anaemia in 1964. Menstruation had ceased in 1968. There had been no children from her 16-year marriage.

Her present symptoms had developed insidiously. For two years she had noted increasing pallor and tiredness, but only over the last three months had she considered the possibility of physical illness. One month before admission she was given iron tablets without symptomatic improvement. Instead, she developed shortness of breath on exertion, extreme fatigue, dizziness, palpitations and ankle swelling. She also noted frequent headaches, and had increasing difficulty in thinking and remembering both recent and remote events, but did not complain of soreness of the tongue, paraesthesiae, unsteadiness in walking, gastro-intestinal disturbances, or loss of weight. Three days before admission, a doctor had given her cyanocobalamin 1000 μg. intramuscularly, though no haematological investigations had been performed.

On examination she was a moderately obese dyspnoeic woman with striking pallor of the mucosae and skin, and there were several bruises on the extensor surfaces of the arms and shins. The tongue was normal. She had a regular full-volume pulse of 96 per minute, with a blood presure of 120/60. The apex beat was 8 cm. to the left of the midline, and the impulse was hyperdynamic; there was an apical triple rhythm with a soft mid-systolic murmur; the jugular venous pressure was raised to 5 cm., and bilateral basal crepitations, a tender enlarged liver and sacral and ankle oedema were also observed. A firm enlarged spleen was felt 6 cm. below the left costal margin. Numerous round and flame-shaped haemorrhages and soft exudates were seen in the optic fundi. The remainder of the neurological examination was normal and in particular there was no evidence of pe-

ripheral neuropathy or cerebellar disturbances.

Immediate investigations gave the following results:

Haemoglobin 4.5 G/100 ml. (32%)

PCV 14%, MCHC 33%, MCV 115 cu.mm.
Reticulocytes 25%

White cell count 3000/cu.mm. (neutrophils 74%, eosinophils 2%)

Platelet count 65,000/cu.mm.

The blood smear showed marked anisocytosis, poikilocytosis, a few macrocytes, occasional erythroblasts, and some polysegmented neutrophil leucocytes.

Serum iron 75 μg/100 ml. Total iron binding capacity 430 μg/100 ml.

Serum folate assay (*Lactobacillus casei* method) 2.3 ng/ml. (normal range 6-20 ng/ml.)

Occult blood in faeces negative x 3.

Serum vitamin B_{12} assay (*Lactobacillus leichmanii* method) more than 1000 pg/ml. (normal range 180 - 900 pg/ml.)

Vitamin B_{12} absorption normal by the Schilling method.

Chest x-ray — slight enlargement of the heart with evidence of pulmonary congestion.

Blood urea and serum electrolyte levels, liver function tests, electrocardiogram and urine analysis were all normal.

Later investigations showed a mildly diminished red cell survival time using the 51 Cr-labelled red cell method. The 3-day stool fat content and xylose absorption test were normal.

A provisional diagnosis of megaloblastic anaemia following long-term anticonvulsant therapy was made. Marrow examination was not performed because of recent vitamin B_{12} medication. It was decided to observe the response to this and to continue with oral iron therapy but not to add folic acid to the treatment immediately. The marked reticulocytosis and rising haemoglobin level which occurred during the first week following admission is shown in *fig. 1*. It will be seen that during the second week there was no further rise in the haemoglobin level. Treatment with folic acid 5 mg. t.d.s. was now added. This was followed by a well-marked reticulocytosis. In the first three weeks of folic acid therapy, the haemoglobin level rose from 6.3 g/100 ml. to 10.5 g/100 ml., at which stage she was discharged from hospital. Treatment by folic acid 5 mg. t.d.s., phenobarbitone 60 mg. t.d.s., sulthiame 200 mg. q.d.s. and diazepam 10 mg. nocte was continued.

Initially, treatment was also given for congestive cardiac failure with satisfactory results. As regards anticonvulsant therapy, phenytoin was discontinued on admission to hospital and sulthiame (Ospolot) in increasing doses substituted. There was a deterioration in epileptic control, three nocturnal fits occurring in the first two weeks. When folic acid treatment was started at the end of the second week, fits became even more frequent and on one occasion status epilepticus supervened but was controlled by intramuscular paraldehyde. Eventually good control was re-established using phenobarbitone 60 mg. t.d.s. and sulthiame 200 mg q.d.s. together with diazepam 10 mg. at night.

When last seen at the outpatient clinic on 24th April 1971 she was well with a haemoglobin level of g/100 ml.

Discussion

Circumstantial evidence leaves little doubt that this patient initially had a megaloblastic type of anaemia, although it is unfortunate that a diagnostic marrow examination was not performed. The peripheral blood picture which showed severe anaemia, macrocytosis, leucopenia, polysegmented neutrophil leucocytes and thrombocytopenia was characteristic, and the response to cyanocobalamin and later to folic acid therapy, in the presence of a low serum folate level, was confirmatory. The red cell survival studies excluded serious haemolytic disease as a cause of splenomegaly, and in any case considerable splenomegaly may occur in uncomplicated megaloblastic anaemia. At outpatient follow-up some weeks later there had been a marked decrease in the size of the spleen. Retinal haemorrhages may occur with severe anaemia of any type but are particularly associated with the megaloblastic anaemias and the leukaemias, and may be related to the associated

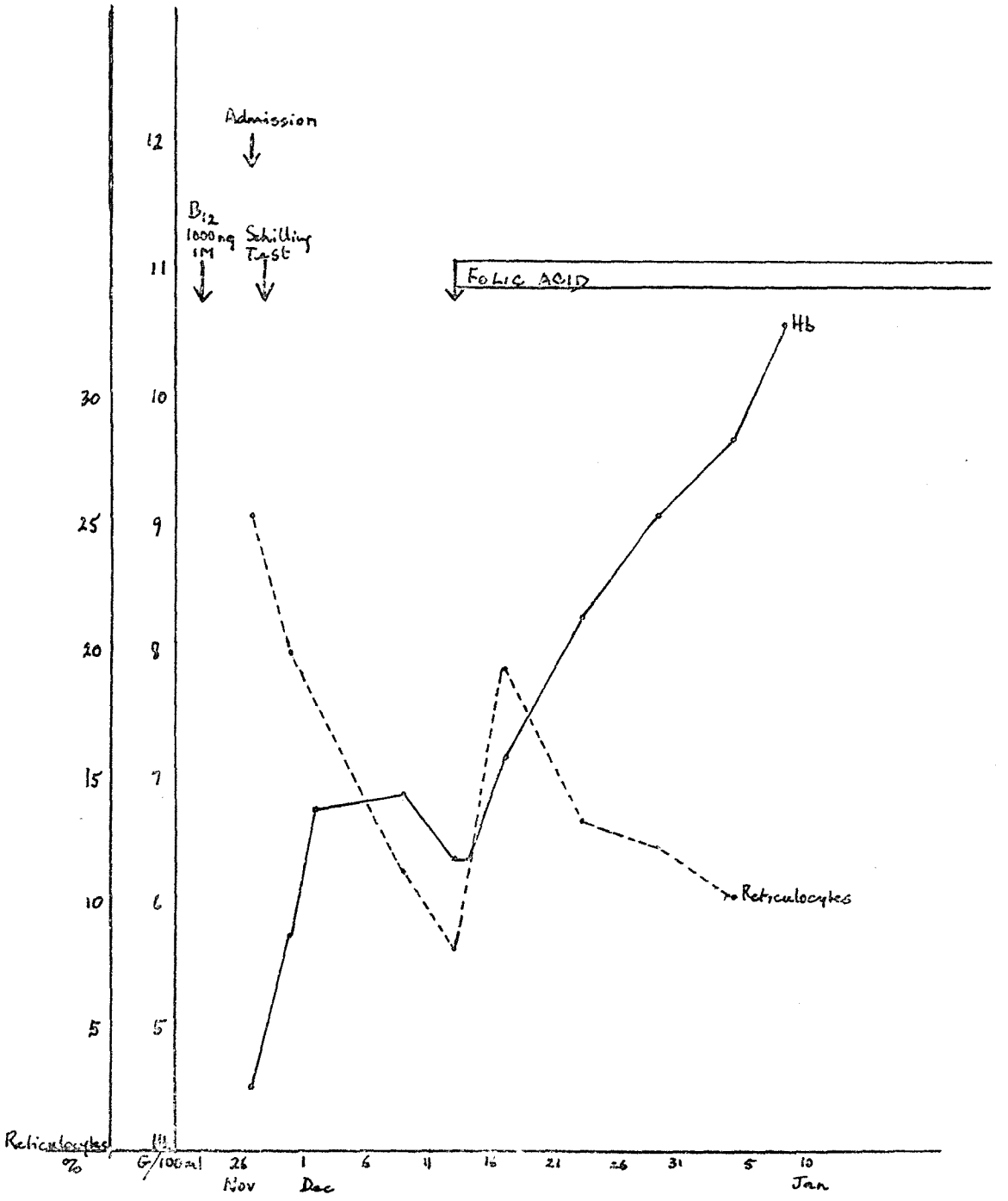
Admission
B_{12} 1000ng IM
Schilling Test
FOLIC ACID
Hb
Reticulocytes
12
11
10
9
8
7
6
5
30
25
20
15
10
Reticulocytes %
G/100ml
26 Nov
1
6
11
16
21
26
31
5
10
Dec
Jan

Figure 1

thrombocytopoenia. The partial response to vitamin B_{12} therapy in the presence of a normal vitamin B_{12} absorption was consistent with folate deficiency. There was no evidence of other causes of folate deficiency such as poor nutrition, malabsorption, liver disease or severe haemolytic disease. She had never been exposed to drugs of the cytotoxic folate-antagonist group. There can be little doubt that anticonvulsant drugs, in the combination of phenobarbitone and phenytoin, were responsible for this patient's haematological picture.

Megaloblastic anaemia is a well-recognised but rare complication of long-term treatment with phenobarbitone, phenytoin and primidone. Evidence of megaloblastic haemopoiesis is commonly seen in patients undergoing anticonvulsant therapy. A macrocytic blood picture has been recorded in 11 - 33% of patients on anticonvulsant treatment (Malpas *et al.*, 1966; Ibbitson *et al.*, 1967; Hawkins and Meynell, 1958) and megaloblastic changes on bone marrow examination in 38% (Reynolds *et al.*, 1966). Serum vitamin B_{12} levels are almost always in the normal range in these patients, though the levels are often lower than in control subject (Malpas *et al.*, 1966). On the other hand, evidence of a disturbance of folate metabolism is commonly found. Serum folate levels of less than 5 μg/100 ml. in up to 80% of patients on anticonvulsant therapy have been reported (Ibbitson *et al.*, 1967; Reynolds *et al.*, 1966). FIGLU tests are of no value in detecting this type of folate deficiency (Reynolds *et al.*, 1966). On this evidence it has become generally accepted that disturbed folic acid metabolism is commonly associated with prolonged anticonvulsive treatment. This induced folate deficiency rarely leads to megaloblastic anaemia, and rather more commonly according to some (Reynolds *et al.*, 1966), to such other manifestations as mental, emotional and behavioural deterioration, florid psychiatric disturbances, peripheral neuropathy, intestinal malabsorption and secondary infertility (Hughes Jones, 1968).

The mechanism of the disturbance of folic acid metabolism is obscure. It is usually considered to be due to a competitive interaction between the anticonvulsant drug or drugs and folic acid (Klipstein, 1964; Hawkins and Meynell, 1958; Reynolds, 1970). It has also been suggested that the drugs may interfere with folate absorption (Hoffbrand and Necheles, 1968). There is no evidence that the mechanism involves liver enzyme induction, which is known to occur with some drugs, particularly phenobarbitone (Conney, 1967).

Anticonvulsant-induced anaemia invariably responds to treatment with folic acid in pharmacological doses (Wintrobe, 1967). There may also be a partial or complete response to treatment with vitamin B_{12}. This is understandable in view of the close association of folic acid and vitamin B_{12} in basic biochemical processes. In our patient vitamin B_{12} therapy led to a dramatic reticulocytosis but a small rise only in the haemoglobin level. A further marked and persistent rise followed the exhibition of folic acid therapy.

The institution of folic acid therapy in patients with anticonvulsant-induced folate deficiency may in turn cause certain problems. An increase in the frequency or severity of epileptic attacks may be induced, and status epilepticus has been observed (Chanarin *et al.*, 1960; Wells, 1968). It has been suggested that the anticonvulsant action of phenobarbitone and phenytoin may be at least in part due to their effect on folic acid metabolism (Reynolds *et al.*, 1966), the low serum folate level contributing to adequate control of the epilepsy. It is possible that the temporary deterioration which occurred in our patient may have been related to the initiation of folic acid therapy as well as the discontinuation of phenytoin. It is uncertain whether in patients with anticonvulsant-induced anaemia, the offending anticonvulsants should be discontinued and others substituted in addition to folic acid administration. It is usually recommended that the dose of these drugs should be reduced to the lowest compatible with adequate epileptic control, as there is some evidence that folate deficiency is related to the dose (Hawkins and Meynell, 1958) and dura-

tion (Klipstein, 1964) of anticonvulsant therapy. In our patient sulthiame, which does not appear to interfere with folic acid metabolism, was substituted for phenytoin but phenobartitone had to be continued to control her epileptic attacks.

It is self evident that folate deficiency resulting from anticonvulsant therapy, when it causes such serious sequelae as megaloblastic anaemia or peripheral neuropathy, must be treated, but does folate deficiency *per se* require treatment? Is there a case for the routine administration of folic acid supplements in all patients on long-term anticonvulsant treatment? The answer must depend on how far the anticonvulsant action is indeed dependent on disturbed folate metabolism. It would seem that, in the present state of our knowledge, supplementary treatment with folic acid should be restricted to those patients in whom psychiatric or neurological disturbances are present, or who have developed megaloblastic anaemia. All epileptic patients on anticonvulsant therapy must therefore be monitored for neurological, psychiatric and haematological deterioration, so that folic acid supplements may immediately be given if the deterioration, which often develops insidiously, can be traced to folate deficiency.

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RECURRENT TETANUS

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Summary

Tetanus may recur in 0.5 - 1.0% of cases, months or years after the initial infection. A review of the literature uncovered 98 cases of recurrent tetanus reported to date. Three cases of recurrent tetanus encountered in Malta between 1954 and 1965 are presented. The recurrent illness has a lower mortality rate than that of tetanus in general, but its treatment presents some difficulties and hazards, mainly of an immunological nature. The possible reasons for recurrence of this disease are reviewed and prophylactic measures are suggested.

It has been known for over half a century that a clinical attack of tetanus can occur in the same individual more than once. A review of the world literature showed that ninety-eight cases of recurrent tetanus have been recorded. Vener and Bower (1940) found five documented cases and described an additional case. By 1950, fifty-four cases had been reported in the German and French literature (Möbus, 1950). In an analysis of 202 cases of tetanus, Garcia Palmieri and Ramirez (1957) included five instances of recurrence of the disease. Thirty-three other cases were added to the literature by various authors between 1954 and 1968 (Martin and McDowell, 1954; Gunaratna, 1958; Alhady, 1961; Wickramasinghe and Malinie Fernando, 1967; and Sahadevan, 1968).

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A recent survey of cases of tetanus encountered in Malta during the period 1954-1968 uncovered three instances of recurrence. The purpose of this paper is to report these three cases and to discuss the possible underlying aetiological factors and therapeutic problems of recurrent tetanus. The details are taken from the records of St. Luke's Hospital, Malta.

Case Reports

Case I.

(1) The patient was V.M., a 56-year-old field labourer. Some twelve days after sustaining a punctured wound in the right foot through the spines of a sea urchin, he developed lock-jaw, dysphagia and neck stiffness. He was admitted to hospital on 21st May, 1954, three days after the onset of symptoms.

On examination, he was apyrexial and had a pulse-rate of 82 per minute. Marked trismus and neck rigidity were evident. The punctured wound in his right foot was hardly detectable.

Treatment for tetanus was instituted. The patient was placed in a darkened, quiet room and sedated by means of Paraldehyde retention enemata. After the uneventful injection of a test-dose of anti-tetanic serum, 100,000 I.U. of tetanus antitoxin were administered intravenously. Fluid balance and adequate nutrition were maintained by means of intravenous dextrose-saline infusion and naso-gastric tube feeding.

Steady improvement occurred on this treatment. The trismus and dysphagia receded in a few days, allowing the discontinuance of intravenous and tube feed-

ing; and all the signs of tetanus disappeared within a fortnight. The patient was discharged from hospital on 5th June, 1954.

(2) Sometime in November, 1956, V.M. sustained a punctured wound in the left sole and, a few weeks later, he noticed a septic fissure in the first interdigital cleft of the right foot; he ignored both lesions. On the 7th January, 1957, he developed increasing stiffness in the lower limbs followed by inability to open his mouth, difficulty in swallowing and painful neck stiffness. When admitted to hospital, on 10th January, 1957, he was running a temperature of 100° F. (37.7° C.) and his face was flushed and exhibited a typical 'risus sardonicus'. Marked rigidity was present in the muscles of the neck, abdomen and lower limbs. The tendon reflexes were very brisk. Generalised muscular spasms occurred periodically.

Treatment followed the previous lines. After intra-dermal, subcutaneous and intramuscular test-doses of A.T.S. had been given without producing any hypersensitivity reaction, 195,000 I.U. of tetanus antitoxin were given very slowly by intravenous drip. One million units of crystalline Penicillin intramuscularly twice daily and 5ml. of Paraldehyde intramuscularly 6-hourly were also administered.

The intermittent spasms ceased within days and the patient made a full recovery within two weeks. He was discharged from hospital on 25th January, 1957.

Case II.

(1) M.G., a farmer aged 70 years, was admitted to hospital on May 4, 1959. He gave a two-day history of lumbo-dorsal backache and increasing stiffness, the latter commencing in the back and spreading to become generalised. He also experienced difficulty in articulation and swallowing. There was no history of wounding but a healed punctured wound was discovered on the plantar aspect of the right big toe.

The patient was pale and sweating, and presented the typical facies of tetanus. Trismus was present, abdominal and back rigidity was marked and the tendon reflexes were exaggerated.

Initial treatment consisted in Chlorpromazine, 25 mg. every 8 hours; crystalline Penicillin, 1 million units twice daily; and Streptomycin, 0.5 Gm. twice daily.

No improvement was recorded on this treatment. Five days after admission the patient developed painful generalised muscular spasms. At this stage, 200,000 I.U. of tetanus antitoxin were administered intravenously at the rate of 15,000 I.U. every half-hour. Following this, the symptoms and signs of tetanus gradually subsided over a period of two weeks. The patient's discharge from hospital was delayed until August 10, 1959 because investigations and treatment had to be carried out for coincidental urogenital and arterial disease.

(2) M.G. was re-admitted to hospital on April 1, 1960 complaining of epigastric discomfort of a few days' duration, associated with ingravescent stiffness of the abdominal muscles, followed later by progressive spasticity of both lower limbs and rigidity of the back muscles. Twenty-four hours before admission he developed dysphagia and intermittent generalised muscular spasms. He could not recall having received any wounds within the preceding few days or weeks.

On examination, the patient was afebrile and had no obvious wounds; he had trismus and muscular rigidity of the abdomen and back. 'Flare-up' of tetanus was diagnosed and treatment commenced. In view of the patient's previous experience of horse serum, three test-doses (intradermal, subcutaneous and intramuscular) of A.T.S.: were given at half-hourly intervals: although there was no hypersensitivity reaction, the therapeutic dose of tetanus antitoxin was restricted to 10,000 I.U. and administered intramuscularly under antihistaminic cover (Diphenhydramine hydrachloride 50mg. t.d.s.). Intramuscular injections of Penicillin (1 million units every 6 hours) were also given.

During the first two days of treatment the muscular rigidity became more severe, but no further spasms were recorded. The symptoms then slowly regressed and recovery was complete in 26 days. The pa-

tient was discharged from hospital on April 27, 1960.

(3) The same man (M.G.) was referred to hospital for the third time on October 28, 1960, with a 6-day history of increasing difficulty in masticating and swallowing solid food. Again, there was no history of recent injury.

On examination, there was obvious trismus and general muscular rigidity; the tendon reflexes were brisk and sustained. The temperature was within normal limits. Tetanus was suspected with some reserve in view of the two previous attacks, and treatment was witheld during the first twenty-four hours of observation. By the second day of admission, however, the progression of the rigidity had made the diagnosis of tetanus obvious.

Treatment consisted in the intramuscular injection of 10,000 I.U. of tetanus antitoxin, with the usual precautions, Penicillin (1 million units twice daily), Streptomycin (0.5 Gm twice daily) and Paraldehyde (5 ml 6 hourly).

The symptoms and signs gradually subsided over a period of two weeks and the patient was finally discharged home on November 19, 1960, twenty two days after admission.

Case III.

(1) M.A., a nine-year-old schoolboy, was referred to hospital as a case of tetanus on July 17, 1964. Nine days previously he had sustained a cut in his left big toe while unpacking cases in a warehouse. He gave a four-day history of increasing limitation of jaw movement, pain on swallowing, stiffness of the neck and pain in the back.

On admission, the patient ran a temperature of 99° F (37.2° C) and had a pulse rate of 100 per minute. He had a typical 'risus sardonicus', trismus and rigidity of the neck and abdominal muscles. Generalised muscular spasms occurred from time to time. A healing incised wound was present on the plantar aspect of his left big toe; in addition he had bilateral otitis with purulent discharge. An aural swab gave a mixed growth of non-specific organisms.

Initial treatment consisted in 105,000 I.U. of tetanus antitoxin by intravenous infusion; Penicillin 0.5 Megaunit 6 hourly; Streptomycin, 0.5 Gm a day; and Paraldehyde, 5 ml six hourly.

During the first few days generalised convulsions took place frequently and, on the fourth day, a further intravenous dose (50,000 I.U.) of antitoxin was given. Thereafter, the muscular spasms became milder and less frequent, until they ceased by the ninth day of treatment. The trismus and general rigidity took longer to clear up. By August 27, 1964 there were no residual signs of tetanus and the patient was discharged.

(2) On July 1965, the same boy (M.A.) was referred to hospital with a two-day history of jaw stiffnes, inability to swallow and voice-change to the nasal type. This time there was no history of recent injury.

On examination, he had a temperature of 100° F (37.7° C) and a pulse-rate of 96 per minute. Trismus was considerable and the tendon reflexes were brisk and sustained. No local cause in the head and neck was found to account for the presenting symptoms; no enlarged cervical lymph nodes were present; and no wounds were detected.

In view of the patient's previous experience of A.T.S. and the mildness of the symptoms, only a fractionated dose of 1,500 I.U. of tetanus antitoxin was given initially, but Penicillin, Streptomycin and Paraldehyde were administered as usual.

During the first two days, the trismus increased and a progressive painful rigidity developed in the muscles of the neck, abdomen and lower limbs. On July 21, the third day after admission, the full treatment regime for tetanus was instituted: an intravenous infusion of dextrose-saline was set up, a naso-gastric tube was inserted for feeding purposes; Paraldehyde was administered more frequently and the Penicillin dosage was increased; tetanus antitoxin (200,000 I.U.) was infused very slowly intravenously, with the usual precautions against anaphylaxis. In spite of this, the signs of tetanus increased in severity during the next few days. Further intravenous doses of antitoxin were given

on July 22 (100,000 I.U.), on July 25 (50,000 I.U.) and on July 29 (50,000 I.U.).

Following the last dose of antitoxin, the patient's recovery from tetanus was rapid, but his discharge from hospital was delayed until August 17, 1965 because of infection at one of the sites used for intramuscular injections.

Discussion

It is, perhaps, not widely known that tetanus may recur in the same individual. In one of our cases (II) the illness recurred twice. A recent survey (Pace, Busuttil and Muscat, 1968) has shown that the incidence of tetanus in the Maltese Islands averages 19.4 cases a year; on the basis of this figure, the three cases of recurrent tetanus reported above represent an approximate incidence of 1% of all cases of tetanus. In their series of 2,007 cases of tetanus, Patel *et al.* (1961) recorded a recurrence rate of 0.84% while Vakil *et al.* (1964) estimated an incidence of 0.5%.

The interval between consecutive attacks of tetanus ranged, in our cases, from 6 to 32 months. A distinction has been made in the past between 'relapse' and 're-infection', on the basis of this time interval. Vener and Bower (1940) defined 'relapse' as recurrence of the manifestations of tetanus within one month of recovery from the previous attack through persistence of the original infection; while Patel *et al.* (1961) considered as relapse any recurrence within six months. In our view, the distinction between relapse and re-infection cannot be made on the grounds of an arbitrary time factor. In fact, there may be three kinds of recurrence, namely:

(1) *recrudescence* of symptoms and signs within a few days of apparent recovery, due to incomplete control of the initial infection; (2) *relapse* of the illness as a result of reactivation of persisting dormant infection in the original causative lesion, weeks or months after control of the previous attack; or (3) *re-infection* of the recovered patient with *Cl. tetani* through the primary unhealed lesion or through a fresh wound, followed by the reappearance of clinical tetanus. With the exception of the first, it is very difficult in practice to distinguish between these various types of recurrence. In the first instance, the apparent wound may not be the portal of entry of *Cl. tetani;* while several cases of tetanus have no demonstrable wound. The possibility of asymptomatic residual clostridial contamination of wounds is well known, and the longevity of *Cl. tetani* spores in such lesions is notorious. Moreover, clostridial spores may be present in trivial, healed, long-forgetten or unknown wounds, where they are very often undetectable, and their reversal to the pathogenic vegetative form is unpredictable. On the other hand, of course, fresh infection through new overt or occult wounds is an ever-present possibility and may occur at any time after recovery from tetanus. Therefore, any attempt to differentiate relapse from reinfection on the basis of the length of the sympton-free period between attacks of tetanus, as suggested by the above-mentioned authors, would have no scientific foundation. In clinical practice, the allocation of given cases of recurrent tetanus into one or other of the three theoretical types proves impossible in the majority. In our view, such a classification is only of academic interest and serves no practical purpose, since it has no bearing on diagnosis, course, treatment or prognosis.

There is now ample evidence that one or more attacks of tetanus do not guarantee immunity from recurrence, nor do they necessarily render any subsequent attack(s) less severe. Turner *et al.* (1957) and Vakil *et al.* (1964) have shown that there is little or no active immunity, as measured by the amount of circulating endogenous antitoxin just after the initial attack and during the recurrent bout of tetanus. It is possible that the surviving cases of tetanus have been exposed to only a small dose of toxin, insufficient to be lethal and inadequate to elicit a significant immune response (Turner *et al.*, 1957). It is also possible that the large therapeutic doses of antitoxin administered during the survived attack depress the patient's active immune response by neutralising toxin before it can exert its antigenic effect (Cook & Jones, 1943;

Oakley, 1963). A very small minority of individuals may be subject to recurrent infection because they possess an incompetent immune system (Soothill and Squire, 1963). The ten antigenic strains of *Cl. tetani* all produce an immunologically identical exotoxin (A. Trevor Willis, 1964); but, in spite of this qualitative similarity, some strains may provide a quantitatively weaker antigenic stimulus than others and, therefore, are less likely to produce a significant degree of active immunity. Finally, Patel *et al.* (1961) consider that, even if some immunity is acquired as a result of the first attack of tetanus, it is likely that a highly virulent infection would swamp the defences and result in a second attack of the disease.

The mortality from recurrent tetanus seems to be lower than that from tetanus in general: none of the cases reported in this paper ended fatally. Vakil *et al.* (1964) ascribed this to a tendency for earlier admission to hospital of those patients with recurrence. We feel, however, that the first infection confers a certain degree of active immunity which, although inadequate to prevent the reappearance of the clinical manifestations of tetanus, is sufficient to afford some protection.

Recurrent tetanus presents important clinical problems. It is uncommon and is relegated to further obscurity by the failure of many textbooks to include a few words acknowledging its existence. This fact, coupled with the occasional absence of an obvious portal of entry of infection may lead to a harmful delay in diagnosis and treatment.

The patient with recurrent tetanus may have received therapeutic doses of Antitetanus Serum (A.T.S.) during the preceding infection. This previous experience of horse serum results in the rapid elimination from the patient's circulation of any antitoxin administered during the recurrent illness, with serious reduction of its therapeutic efficacy (Payling Wright, 1963). Therefore, large doses of Antitetanus Serum, repeated at short intervels, would seem to be required for effective antitoxic therapy in recurrent tetanus. In the circumstances, the danger of anaphylactic reactions looms large (vide Cox, 1963). Although, fortunately, none of our patients developed untoward reaction to A.T.S., Vakil *et al.* recorded hypersensitivity reactions in 6 out of 11 patients. In view of this, if A.T.S. has to be used, the routine employment of repeated test doses followed by fractionation of the therapeutic dose should be the rule; concommitant cover with antihistaminics or corticosteroids may also have to be considered. Ideally, Human Tetanus Hyperimmune Globulin should be used as this would be safe and effective, but it is still rare and expensive.

In the light of the foregoing, prophylaxis emerges, as always, the ideal to be aimed at. Active immunisation by means of adsorbed toxoid should be offered to all recovered cases of tetanus. It would seem particularly advisable in 'high-risk' individuals, such as children, field labourers and patients suffering from chronic ulceration or undergoing self-administered parenteral therapy, particularly diabetic

Acknowledgements

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SOME ASPECTS OF BRUCELLOSIS

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The occurrence of human brucellosis in Malta is of long standing and has presented various problems ever since it became accurately diagnosable and clearly distinguishable from other prolonged fevers. Between 1896 and 1964 incidence has ranged from a maximum of 81.6 per 10000 inhabitants in 1946 (2410 cases) to 1.7 in 1964 (56 cases). In 1939 centralised pasteurization of milk was introduced but only in a small area (Valletta and Floriana), with a population of about 24000, was the introduction and use of unpasteurized milk then forbidden by law. Gradually this prohibition was extended until it became complete in 1964, the last area in which the ban was made effective being the island of Gozo which, with a population of about a tenth of that of the two islands, had an incidence of brucellosis ranging from a sixth to as much as half of the total number of cases over the period 1953 to 1969. (Agius, 1965)

Between 1956 and 1969 an intensive study of the disease in the animal population in Malta and of the possible means of preventing it was carried out by an expert working for F.A.O./W.H.O. and the Government of Malta, in conjunction with Government veterinary officials and others. A vaccine was tested, found to be effective and safe and put to limited use. Various measures were taken to control caprine and bovine brucellosis and a decrease was noted both in the animal and in the human incidence of the illness. (Alton G. G. 1968). The reported incidence in man since 1964 has been as follows: 70 cases in 1965, 24 in 1966, 29 in 1967, 14 in 1968, 57 in 1969, and 51 in 1970. Throughout this period the population can be considered to have remained stable at about 320,000. The fact stands out that by 1968 a record lowering of incidence had been obtained and one could reasonably have begun to hope for eradication of the illness. This could only be attained by the eradication of the disease

in the animal reservoir such as has in fact been attained in some countries.

The incidence since 1968, however, is disturbing for instead of the expected further decreases or, at least, stabilisation of the position, there have been notable rises. The writers, working in the Bacteriology Department of the main and by far the largest general hospital in the island, have an opportunity of learning about the occurrence of cases and they believe that the real number of cases is certainly greater though not very markedly so than the number of cases reported. There is often some doubt about the point at which a positive agglutinin titre can be considered as diagnostic of an active and present infection but the incidence would be still higher, judging by laboratory findings, than the reported incidence even if only a titre of 1/320 or higher is taken as significant. In 1970, for example, there were 12 such cases including two with a positive blood culture. Failure to notify does not generally arise from a reluctance to accept the agglutination reaction(at least at 1/320 or higher) as a positive finding but through other causes often purely fortuitous. In fact it is probable that some cases with a titre below 1/320 may be ones of active brucellosis; one such case with a titre of 1/80 had a positive blood culture. In view of this it is likely that the real number of cases markedly exceeds the reported incidence. This is not surprising since this occurs everywhere to a varying extent and can be allowed for. However in our environment and under the prevailing circumstances this has a particular importance. When eradication is being aimed at completeness of notification becomes vital, since the origin of every case must be accounted for. In brucellosis fortunately the human patient is not very important as a cause of other cases but even this aspect should be considered.

How can the cases which have arisen since 1968 be accounted for? The question is not easily answered. Obviously the first point to consider is whether pasteurised milk could have led to infection. In fact a close surveillance of the whole process is maintained, most of it being of an automatic, self-registering character. Surveillance is exercised over milk as it reaches the consumer both by the laboratory attached to the Milk Marketing Undertaking and, quite independently, by the laboratory at the Head Office of the Health Department, a large number of samples being regularly examined every week. (Report, Health Dept. Malta). No test has ever shown any fault in pasteurization or anything to suggest the possibility of pathogenic micro-organisms having survived the heat treatment. It is also probable that if unpasteurized milk had ever gone out to consumption there would have been a noticeable outbreak comparable in character to that of a water-borne epidemic; this has not been the case.

In every reported case the Health authorities carry out a close investigation, which generally, but by no means always, leads to suspicion being cast on some definite way of infection. Between the 7th and the 22nd March 1969 a milk suppliers' strike led to a suspension of the pasteurized milk service. It was still illegal to sell unpasteurized milk throughout that period but obviously the temptation for the milk producers to sell milk illegally was very great. At St. Luke's during the first 3 months of that year there had been only 5 cases of brucellosis whilst there were 57 cases by the end of December. In 1970 there was a similar strike from the 14th to the 28th April; there had been 22 cases up to April and there were 60 cases in the remaining 8 months. It was not possible to explain every case on this basis; in fact this would apply only in a few cases.

Frequently, questioning rules out the possibility of the infection having arisen from the consumption of milk; a surprisingly large number of persons insist they never use milk as such, the majority maintaining they use either pasteurized or tinned milk. In such cases the alternatives are:

a) contraction of infection through occupational exposure. Locally there have been cases amongst workers in laboratories, in a veterinarian and in a doctor

where one could almost establish the incident which led to infection.

b) through ingestion of accidentally contaminated food. This is often a surmisal but cannot be ruled out. One practical possibility is through consumption of meat from animals which could have been harbouring Brucella organisms. (Agius Ferrante 1970). Meat from various animals is used in sausages, which could be eaten uncooked. In Malta sausages consist wholly of meat and are fairly widely consumed.

c) through inhalation of dust polluted by urine of diseased animals. This, is only a legitimate surmisal.

d) through the consumption of cheese made from infected milk. Patients frequently admit to the consumption of fresh cheese and this then appears as the most likely source. For the information of non-Maltese readers we may say that there are special cheeses made in Malta which are marketed either "fresh", a few days after they are made and still soft, or "dried" for a longer and variable period after manufacture, when they are harder. *("ġbejniet moxxi")*. These latter are sometimes consumed after they have been liberally sprinkled with pepper and steeped for days in vinegar *("ġbejniet tal-bżar")*. Traditionally cheeses are made from sheep's milk and sheep in Malta have been repeatedly proven to suffer much less frequently than goats and cows from brucellosis (Alton 1968). However, even a small proportion of animals could be a source of danger and it is probably true that tradition is occasionally departed from and goats milk is used in cheese making. Moreover, one of the great centres of cheese making is Gozo, where brucellosis is frequent. Brucella organisms do survive the cheese making process consisting in coagulation with rennet. One of us cultivated Brucella from cheese made by the method adopted locally and using artificially infected milk 3 days after it had been manufactured (Report 1940); Gilli (1943) states it can survive in fresh cheese for up to 44 days. Gargani (1952) found Brucella to survive for 90 days. The Joint FAO/WHO Expert Committee on Brucellosis (Report, 1971) states that *Brucella melitensis* can survive in cheese for 100 days. One is reluctant to attribute the illness to the consumption of cheese since most people eat cheese at some time or other and the explanation may appear too facile, but it very often seems to be the only one discoverable.

Complete eradication of the disease will not occur unless brucellosis is eradicated in the animal reservoirs and this still needs the complete putting into effect of the measures now available. For this a sustained effort fully backed by the local Government and FAO/WHO is essential. At the moment things are not quite right from this point of view but there is a glimmer of hope that they may be righted in the not too distant future. Notification must be more accurate and complete. The consumption of cheese is one source of infection which could and should be dealt with at once. The Milk Marketing Undertaking does produce and sell excellent cheese made from pasteurized milk, but it does so intermittently and the supply does not keep pace with the demand. It is time the sale of cheese made from unpasteurized milk was forbidden: only so can this loophole be plugged. It would be an excellent idea if the making of cheese locally was changed from a cottage industry to a properly organised one selling a safe and guaranteed product. It also appears reasonable to suggest that a warning notice should be displayed when cheese made from unpasteurized milk is being offered for sale. Apart from every scientific consideration one should note that the three types of local cheese are really delectable and could grace a gourmet's table. We have the makings of an excellent industrial enterprise and even export would be a great possibility when the day comes when one can recommend Malta cheese without any fear.

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We thank other members of the laboratory staff whose work supplied some of the results quoted, Mr. A. Serge, O. i/c Statistics, Health Department and Mr. C.

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DR. C. DE LUCCA AND HIS WORK AS A BIOLOGIST

MARIO GAUCI

Dr. Carmelo De Lucca who died on the 6th March, 1971, was born at Msida, Malta, on the 24th November, 1916. He studied at the Lyceum and later at the Royal University of Malta, where he obtained the Bachelorship in Science and qualified as a Pharmaceutical Chemist in 1939. He graduated in Medicine in 1943.

He served as Resident Medical Officer in the various Hospitals of the island from 1943 to 1946. He was appointed District Medical Officer on the 24th August, 1946 with residence in the village of Gharghur, Malta, where he lived until his death and in whose neighbourhood he carried out many of his observations on the entomological and ornithological life of Malta.

Dr. De Lucca was at the University of Malta as Demonstrator in Biology for the periods 1947-50, 1953-56 and from January to May 1959 and from 1962 up to the time of his death as Lecturer in Pharmacognosy.

In 1964 Dr. De Lucca was invited to attend a congress of Mediterranean Biologists, held at the Institut Océanographique of Monaco by the Commission Internationale pour l'étude scientifique de la Mer Mediterranée. At this Congress he read a paper entitled "The place of Lepidoptera in the Zoogeography of the Maltese Islands" which was published in the Rapports et Procés-verbaux des Réunions de la C.I.E.S.M.M. (volume xviii (2) 1965).

When the Ministry of Education, Culture and Tourism decided to set up a National Sciences and Folklore Museum at Vilhena Palace at Notabile, Malta, Dr. De Lucca was appointed, on the 1st July 1967, Assistant Curator of the Natural History Section. On the death on the 3rd October 1970 of the Curator of the Section, the late Professor H. Micallef, Dr. De Lucca acted as Curator.

In 1969, Dr. De Lucca published "A revised check list of the Birds of the Maltese Islands". This check-list was the result of about forty years of watching, recording and collecting as many specimens as could be reasonably found in the Maltese Island. Particular attention was given to re-assessing and determining the subspecies of birds found in both islands and to arranging the Families, Genera, etc., in accordance with modern views on Bird Systematics. The Publishers (E. W. Classey Ltd. of Hampton, Middlesex) in the Introduction wrote: "... Self-advertise-" ment would sit strangely on the should-" ers of the author of the present work " and in fact, the reader will find that the " work itself is all that is necessary, or " indeed could be said, in praise of his " scholarship."

Through the good offices of Dr. De Lucca, his father, Mr. Vincenzo De Lucca, donated in 1969 to the Museum Department, Malta, a fine collection of birds consisting of over 600 mounted specimens and including a number of rare items.

In 1970 Dr. I. R. F. Brown and Professor W. H. Bannister of the Deparment of Physiology and Biochemistry of the Royal University of Malta and Dr. De Lucca published "A comparison of Maltese and Sicilian Sparrow Haemoglobins" in the Journal of Comparative Biochemistry and Physiology, vol. 34 published by the Pergamon Press of Great Britain.

Dr. De Lucca was a Member of the British Ornithologists' Union, the British Ornithologists' Club, the British Trust for Ornithology and the Società Italiana di Scienze Naturali, a Fellow of the Royal Entomological Society of London and the local representative of the Royal Naval Bird Watching Society.

A list of publications by Dr. De Lucca is given below:

1948

Notes on some moths observed at Malta. "The Entomologist's Monthly Magazine", vol. lxxxiv, 30th July, 1948, listing seven moths occurring in but not previously recorded for Malta.

Some species of Crambidae (Lepidoptera, Heteroneura, Pyralinae) observed in Malta — "The Entomologist", vol. lxxxi, October, 1948.

Six species of Lepidopterous fauna not previously recorded for Malta.

Some aspects of the Biology of the Lepidoptera — "Scientia", vol. xiv, No. 2 April-June, 1948. A description of the life stages of Lepidoptera.

1949

Further moth captures from Malta — "The Entomologist's Monthly Magazine", vol. lxxxv, 25th April, 1949. Nine species of Lepidoptera not previously recorded for Malta.

Further notes on Lepidoptera Heterocerna from Malta — "The Entomologist's Monthly Magazine", vol. lxxxv, 22nd Juliy, 1949.

Eleven species of Lepidoptera caught between 1940-48 and not previously recorded for Malta.

Microlepidptera new to the Maltese Islands — "The Entomologist", vol. lxxxii, July, 1949.

Twelve species of microlepidoptera not previously recorded for Malta.

1950

Contributo all'Ornitologia delle Isole Maltesi — "Rivista Italiana di Ornitologia", anno xx, serie II, 1950.

Systemic list of rare or accidental birds caught in Malta since about 1936.

Casual immigrant Rhopalocera in Malta — "The Entomologist", vol. lxxxiii, February, 1950.

An account of species of Rhopalocera occurring in Malta and recorded by various authors.

A contribution to the list of Maltese Lepidoptera — "The Entomologist's Monthly Magazine", vol. lxxxvi, 8th September, 1950.

Twenty-five species of Lepidoptera Heterocera caught by the Author during the years 1948-49 and not previously recorded for Malta.

Additional records of Micro-Lepidoptera from Malta — "The Entomologist", vol. lxxxiii, November, 1950.

Fourteen species of Crambidae, Pterophoridae, Phaloriidae, Cosmopterygidae, Oecophoridae, Ethmiidae and Tireidae caught by the Author and not previously recorded for Malta.

1951

Notes on the biology of Cnephasia Gueneanae Duponchel (Lepidoptera: Fortricidae) — "The Entomologist", vol. lxxxiv, September, 1951.

The larval form of this species was first discovered by the Author and described in these "Notes".

New additions to the Lepidoptera of Malta — "The Entomologist", vol. lxxxiv, November, 1951.

Twenty-five species of Heterocera and Microlepidoptera caught by the Author and not previously recorded for Malta.

1953

Additions to the list of Maltese Microlepidoptera — "The Entomologist's Monthly Magazine", vol. lxxxix, 28th May, 1953.

Twenty species of Crambidae, Phycitinae, Pyralinae, Pterophoridae, Eucosmidae, Glyphipterigidae, Gelechiidae, Plutellidae, Oecophonidae, Depressariinae, Gracilariidae and Tineidae caught by the

Author and not previously recorded for Malta.

1956

New additions to the Lepidoptera of the Maltese Islands — "The Entomologist", vol. lxxxix, October, 1956.

Thirty-twe species of Nocteridae, Caradrinae, Phytonetrinae, Catoculinae, Geometridae, Sterrhinae, Geometrinae, Phycitinae, Pyraustinae, Pteroforidae, Pholoniidae, Eucomidae, Gelechiidae, Cosmoptyridae, Oecophoridae, Coleophoridae, Tineide caught by the Author and not previously recorded for Malta.

1959

Note sull'Ornitologia delle Isole Maltesi — "Rivista Italiana di Ornitologia", XXIX year, series II, Milan 1959.

The correct status of many subspecies of birds new to Malta assessed by the Author and his father, Mr. Vincenzo De Lucca — co-authors of these *"Note"*.

1965

The place of Lepidoptera in the Zoogeography of the Maltese Islands — Extraits des Rapport et Procés-verbaux des Réunions de la Commission Internationale pour l'étude scientifique de la Mer Mediterranée, volume xviii (2) 1965.

A paper on the faunal and vegetation aspects and the characters of Maltese Lepidoptera prepared and read by the Author at a congress of Mediterranean biologists held at Monaco in 1964.

1967

The migration of birds — "Journal of the Royal University of Malta Biological Society", — January, 1967.

Notes on the Migratory movements of birds.

Cisticola juncidis in Malta" — "Ibis", 109, no. 4, October 1967.

Recording the occurrence of four birds of this species at Salini, Malta, in June, 1967.

Appunti sull'Ornitologia delle Isole Maltesi — 'Rivista Italiana di Ornitologia', XXXVII year, series II, Milan 1967. — Systematic list of rare or accidental birds occurring for the first time in the Maltese Islands between 1955 and 1966.

1969

Emitteri Eterotteri Maltesi — 'Bollettino della Società Entomologica Italiana', vol. xcix - ci, no. 5-6, 20 June 1969.

Systematic list of twelve species of Miridae, Lygacidae, Pyrrhocoridae, Rohopalidae, Pentatomidae, Cydnidae caught by the Author and not previously recorded for Malta.

Lepidoptera of the Maltese Islands — 'Entomologist's Record' vol. 81, 15th May 1969. Systematic list of twenty-six species Heterocera and Microlepidoptera caught by the Author or by Mr. P. Sammut and not previously recorded for Malta. The Author also refers to the capture of sixteen rare species during the period 1951-66.

Bird migration over the Maltese Islands 'Ibis' III, July 1969.

A broad survey of bird migration.

A revised check-list of the Birds of the Maltese Islands — E. W. Classey Ltd. Hampton, Middlesex, Fefruary 1969.

Besides giving a true picture of the past and present status of the various species of birds found in the Maltese Islands, the Author gives the subspecies or races of all the birds known to occur or to have occurred in the Maltese Islands as migrants, resident, rare visitors or vagrant and records those species or subspecies that have been identified since 1917 including new occurrences.

Besides the abovementioned publications, Dr. De Lucca supplied the necessary material on which the following publications were prepared — *Une nouvelle variété d'Aciptilia: A. spicidactyla insularis nova* by L. Bigot in 'Lambillionca', vol. lxi, nos. 7-8 of the 25th August 1961.

A description of a moth, based on specimens caught and supplied by Dr. De Lucca and which, on account of the smaller wingspan, M. Bigot considered to be a species different from the typical one.

Two new Micro-Lepidoptera from Malta — by Dr. H. G. Amsel of Baden, 'The Entomologist', vol. lxxxv, no. 1071, August 1952.

Description of a new species which the Authur dedicated to Dr. De Lucca (Oegoconia deluccai sp.n.) and of a new

species (Apatema fasciata melitensis ssp. n.) which were both caught in Malta by Dr. De Lucca in October 1950.

Newe Pterophoriden, Gelechüden und Tineiden aus Palästina und Malta by Dr. H. G. Amsel of Buchenburg/Baden in Bull. Soc. Fouad ler Entom.' xxxviii, 1954 (51).

Description of four new species of Pterophoridae, Gelechiidae and Tineidae. Of these species, one was named by Dr. Amsel after Dr. De Lucca (Praeacedes deluccae sp.n.). These lepidoptera were caught by Dr. De Lucca in Malta.

Uber Mediterrane Micro-Lepidopteren und einige Transcaspische arten von Hans Georg Amsel (Karlsruhe) in the 'Bulletin' of the Institut Royal des Sciences Naturelles de Belgique, tome xxxi, no. 83, Bruxelles, December 1955.

RETROPERITONEAL TUMOURS

A Study of Five Cases

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Retroperitoneal tumours and cysts are often regarded as a nebulous group of lesions with a sinister reputation, probably through their uncommon incidence coupled with the fact that their potential site of origin, is anatomically extensive and may be remote. The many and varied pathological classifications put forward in the literature add little to help one form a sharper mental picture of the clinical problem they pose. The present communication is a study of five cases which have all come under our care in the space of a few months.

Case 1. P.B. Male aged 29.

First admitted to hospital in Melbourne, Australia in February 1970 with a history of progressive loss of appetite coming on in December 1969 followed, within a month, by continous pain in the back felt on both sides but worse on the left. He also complained of epigastric pain felt immediately on eating. Three weeks previous to admission he had had a bout of melaena, and four days before admission he had haematuria with passage of clots per urethram. There was no haematemesis, no haemoptysis and no chest pain or cough.

On examination he looked pale. There was no cervical node enlargement. Pulse 80, regular; B.P. 140/80.

There was good chest expansion, good air entry throughout and normal breath sounds. The heart sounds were normal.

Abdominal examination revealed a tender mass in the left loin. Special investigations were as follows:

Ba. Meal: No free oesophageal reflux or hiatus hernia. Stomach was reasonably well filled and outlined. No obvious organic lesion could be seen. Unable to fill the duodenal cap sufficiently to exclude pathological states.

Chest X-Ray — Pleural fluid left base. No obvious pulmonary changes.

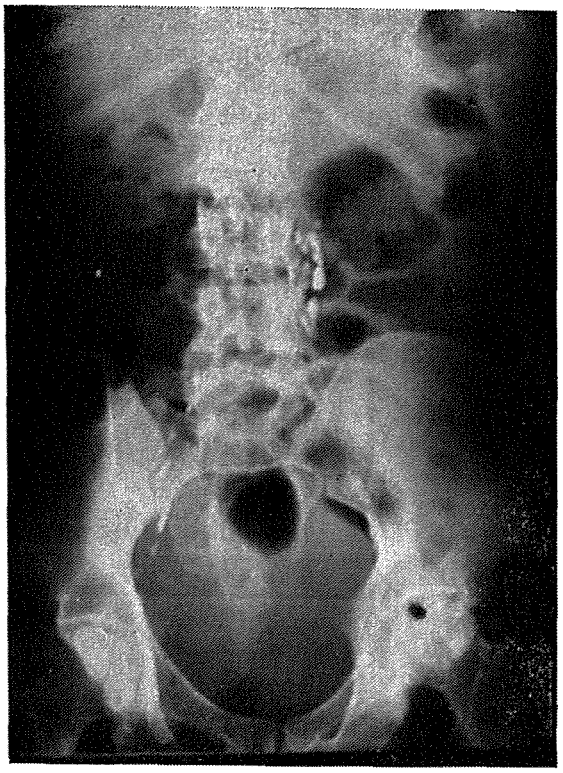
Hgb. 9 G., Prothrombin 80% Serum Bilirubin 0.3 mgm %.

At operation, preliminary cystoscopy, revealed blood and clots coming from left ureteric orifice. Laparotomy showed a large hard craggy retroperitoneal mass extending from the level of L.1 beneath the spleen, across the pancreas to beneath the liver. The mass was involving the left ureter and lymph nodes in the greater omentum. The small bowel was clear of tumour.

Biopsy material was reported upon thus: A large firm lymph node measuring 1.5 by 2 cms. Microscopically almost all the lymphoid tissue is replaced by diffuse proliferation of cells with large round to oval vesicular nuclei with prominent nucleoli. Mitotic figures are numerous. There is a fair amount of reticular formation. The tumour is also infiltrating the surrounding adipose tissue. Diagnosis: Reticulum cell sarcoma.

Following operation the patient developed melaena, the Hgb falling to 3.6 G. He was transfused with 8 pints of blood. He was later transferred to Peter MacCallum Clinic for Mega Voltage Therapy.

He was at this Clinic for a month from 25.2.70 to 24.3.70 Amongst the special investigations he had there was a lymphogram, reported upon as follows: A bilateral injection of contrast was made. The nodes and vessels in inguinal, iliac and para-aortic regions were outlined. The upper one third of the thoracic duct appeared moderately dilated but the significance of this finding was not evident. The iliac nodes on either side appeared within normal limits. Two groups of para-aortic nodes were demonstrated one on the right side opposite L2-L3 and one on the left opposite L3-L4. The nodal tissue appeared abnormal and involvement by the malignant lymphoma has almost certainly occurred. The absence of nodal tissue above the level of L3 on the left side would suggest surgical removal above this level. The appearance of the inguinal nodes on either side remains equivocal. Lymphatic stasis is demonstrated adjacent to these nodes and patchy filling is seen within them. These changes may be related to the malignant process or they may have resulted from previous infection.



Case 1: **Lymphogram**

On 14.3.70 he returned from weekend leave complaining of severe left chest pain. X-Ray chest showed further elevation of left hemi-diaphragm and partial collapse of the left lower lobe together with a small left pleural effusion. The appearances were considered to be due to a pulmonary infarct or consolidation, collapse resulting from bronchial occlusion. IVP showed kidneys normal in outline and function. The left pelvicalyceal system appeared attenuated and the upper one third of the left ureter appeared somewhat irregular. These appearances would suggest that early infiltration of the kidney and ureter by the lymphoma may have occurred but these findings are not diagnostic.

On 21.4.70 he was admitted to St. Luke's Hospital, Malta. He was then complaining of severe pain in low back and occasional vomiting. His general condition was poor. He showed wasting. No enlarged lymph nodes were present in the neck, axillae or groins. His abdo-

men was tensely distended, shifting dullness and a fluid thrill being present. There was bilateral ankle oedema. Hgb 81%, PCV 40%, WBC 16,400, ESR 40 mm. Chest X-Ray L. pleural effusion. On 22.4.70 nine pints of straw coloured turbid fluid were removed from his abdomen.

He was started on a course of i.v. cyclophosphamide and given opiates for the persistent pain. His subsequent course was relentlessly downhill. At no time did he show any response to the cytostatic drugs afforded to him and these included chlorambucil, vinblastine and prednisone.

There was reaccumulation of fluid in his abdomen and left chest necessitating repeated tappings.

His pain never left him and he complained bitterly of it as it affected the left lower chest wall which was often tender on palpation.

On 1.8.70 he developed paraplegia. On 25.8.70 he died.

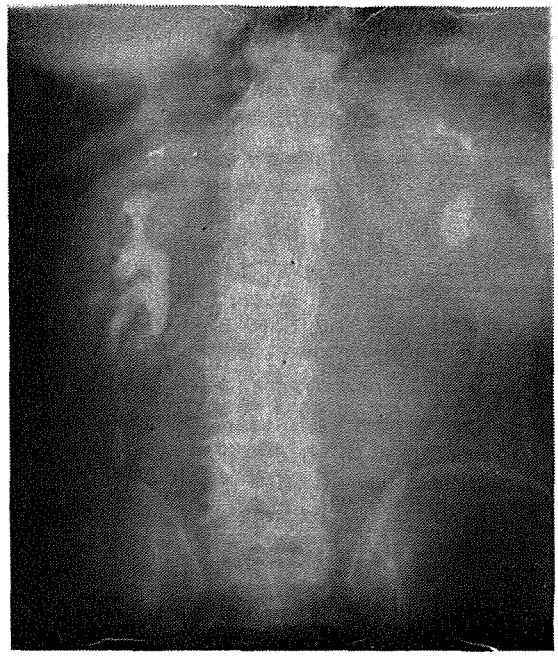
Permission for post mortem examination was not given.

Case 2. S.T. Man aged 74.

This patient presented on 22.7.70 complaining of a gradual increase in abdominal girth which he had noticed over the previous three months with "hardening" of his abdomen. There was no abdominal pain of any note but occasional mild dragging pain was present. His bowel habit was not disturbed though he did tend to being occasionally costive. His appetite had fallen off and he thought he had lost some weight. There was no nausea and no vomiting. He had never noticed passing any blood with his stools or his urine. He had no difficulty with urination but was experiencing a slight (3 to 5) nocturnal frequency in the last few months.

He was admitted to St. Luke's Hospital on 23.7.70. On examination he looked slightly pale and drawn; T. 99° F Pulse 100/min, regular and good volume. B.P. 195/100 There was no cervical node enlargement, and no jugular congestion Examination of the chest showed good air entry on both sides; some fine crepitations were audible over both bases. The apex beat was in the 6th interspace outside the mid-clavicular line. There was a soft systolic murmur localised to the apex and the left para-sternal region.

The abdomen was grossly distended. Its entire cavity seemed to be filled by a large, well defined, bilobular, rubbery, hard, non-tender mass which showed a fair degree of lateral mobility. Normal bowel sounds were audible. There was a left inguinal scar, no enlargement of inguinal lymph nodes. A right inguinal hernia was present. Rectal examination showed slight enlargement of the prostate.



Case 2: Showing displacement of left ureter

The following investigations were carried out: Hgb. 72% PCV 39% No proteinuria, no glycosuria, Blood Urea 14 mgm %.

Serum electrolytes Na-126 m.Eq., K-4.4 m.Eq., Plasma chloride 93 m.Eq./ Litre. Modified Glucose Tolerance Test: Fasting blood glucose 78 mg./100ml. 2 Hour Blood Glucose Level: 155 mg./100 ml. Urine glucose absent.

Faecal Occult Blood: Positive in 1 instance in 3. I.V.P.: Mass in mid-abdomen mainly to left side with irregular calcification anteriorly and to the right. Re-

troperitoneal, not connected to renal tract. Both kidneys concentrate the dye well. Left Ureter displaced. No abnormality in kidneys.

Operation was performed on 5th August 1970. G.A. Dr. J. Psaila, and Dr. Alex Galea.

Through a left paramedian incision a large solid and highly vascular retroperitoneal tumour was removed. It was seen to be arising from the anterior aspect of the abdominal aorta seeming to have burrowed into the sigmoidmesocolon. In the course of its dissection parts of the mesocolon and adjoining segment of colon were inadvertently contused but the bowel was not opened. Haemorrhage was at times difficult to control. A tube caecostomy was performed prior to closure with drainage. Six pints of blood were given over the operation and immediate post operative period. The tumour weighed $12\frac{1}{2}$ lbs. or 5750G.

On the third day after operation he developed intractable hiccup, and on the sixth day post-operation a faecal discharge was evident through the site of his tube drain. Meanwhile the caecostomy had already begun to function.

His further post-operative recovery was slow but unattended by other complications and he was discharged home with wound healed and a dry abdominal wall on 7th September 1970.

He was next seen at Follow Up Clinic on 26.9.70. His general condition had begun to pick up, he was eating better and had no amdominal pain or discomfort. He was however troubled by having to go to stood 6 to 8 times a day to pass soft normal coloured faeces. He was put on an opiate mixture.

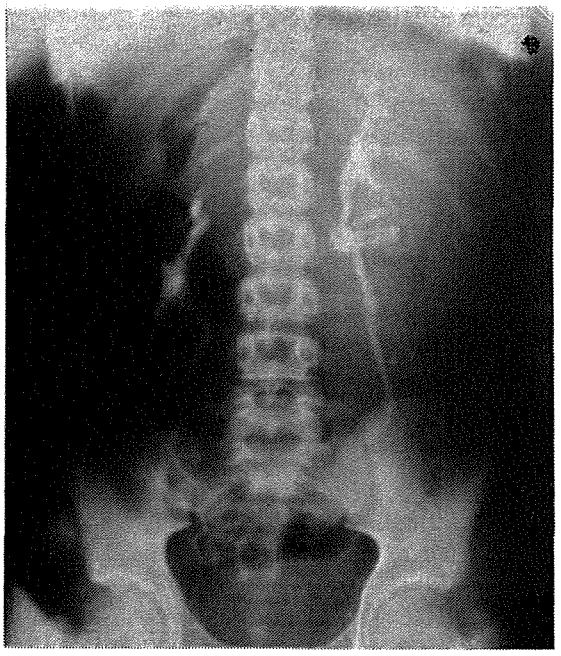
On 10th October when he next reported he complained of constipation, not having had a motion for four days.

He was now putting on weight and his abdomen was soft and not at all distended. A barium enema was asked for.

The barium Enema report dated 17.10.70 ran as follows: No signs of obstruction in the colon. There is however a fistulous communication in sigmoid region with formation of an irregular cavity and a long narrowed sinus. The outline of the colon is not much altered and the condition is probably due to an inflammatory process which has produced adhesions and perforation of the colon.

Case 3. P.B. Girl aged 12.

This girl was first referred to the Medical Division under the care of Dr. Luis Vassallo on 27.7.70 for abdominal pain and splenic enlargement. She had been quite well until about three weeks before admission when she first began to have intermittent fairly severe pain in left upper quadrant of abdomen. It was severe enough to make the patient take to bed. Her appetite was not impaired and there was no nausea or vomiting. Her bowels were regular. There was no loss of weight. Micturition was normal.



Case 3: Showing tooth rudiment

On examination she was a pale, timid, apprehensive girl. No lymphadenopathy was noted in neck, axillae or groins. Pulse Rate 112/min., B.P. 120/90.

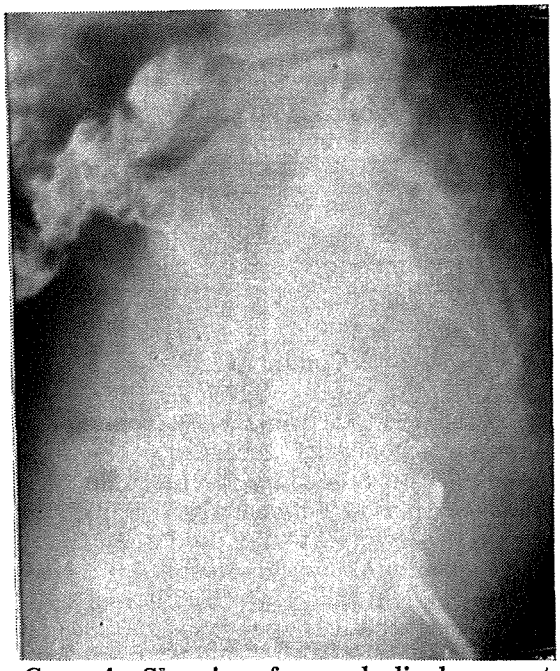
A large mass was palpable on the left side of the abdomen extending back to the loin. It was firm and smooth and dull to percussion. Her blood picture

showed a Hgb of 96% or 14.2G, W.B.C. 8,300, E.S.R. 5 mm. 1st hr., I.V.P. showed a mass in the left hypochondrium separated from the kidney and containing a toothlike structure, suggesting dermoid cyst.

Laparotomy was performed on 11.8.70 under general anaesthesia (Dr. C. Borg). A large retroperitoneal cyst arising from an area situated below the tail of the spleen was removed through a left paramedian incision. The abdominal wound was closed with drainage. She made a good post-operative recovery and was discharge with wound well healed on 30.8.70.

Case 4. Male F.G. aged 70.

27.8.70 Referred to Surgical Out Patient Clinic for "Haemorrhoids". This patient stated that he had been troubled with piles for some 11 years. His more immediate concern however was that of constipation. There was no history of prolapse or anal bleeding. On examination he was a well preserved florid corpulent man. There was no cervical lymphadenopathy. The chest was clinically clear.



Case 4: Showing forward displacement of rectum

The abdomen was well covered and no masses or organs were palpable. Rectal examination revealed a large smooth hard mass occupying the sacral hollow and abutting on the lower rectum. The rectal mucosa could be moved over it though the mass itself was completely fixed. The prostate was small and firm.

Investigations gave the following results: Hgb-100%, W.B.C. 9,900. Serum alk. phosphatase 8.7 K-A units, acid phosphatase 0.5 K.A. units. Blood urea 35 mgh%.

Barium enema showed a forward displacement of the rectum with a rounded indentation at the posterior aspect, suggesting a presacral mass.

Operation under general anaesthesia (Dr. F. X. Micallef) was performed on 13.10.70.

The tumour was explored through a sacro-perineal approach with excision of the coccyx and last piece of sacrum. It was found to be filling the true pelvis and to extend upwards to beyond the promontory of the sacrum. It was quite fixed to this latter bone and seemed to be arising from it. It was enveloped in a pseudocapsule which, on opening, revealed the tumour to consist of a gelatinous chondro-osseous mass. Most of this material was scooped out in the face of fairly brisk bleeding, the resulting cavity being packed.

A lateral left iliac colostomy was performed. His post-operative course was punctuated by bouts of severe hypogastric pain and retention. This was to some extent relieved by catheterization. He is now passing urine per urethram and relieved of pain.

The histological diagnosis was as follows "Several hemorrhagic portions of lipomatous tissue that measure $9 \times 7 \times 6$ cms. Section shows a myxomatous sarcoma infiltrating fat. Cellular pleomorphism is a prominent feature and mitotic activity is considerable."

He was referred to Dr. Sultana for radiotheraphy; but was however turned down because: "size of tumour, its histological nature, and the obesity of the patient contraindicated even an attempt at palliative radiotherapy."

Case 5. J.A.B. aged 3½ years.

He was referred to the Paediatric Wards under the care of Dr. T. Agius Ferrante on 29.1.69 with a 2 month history of abdominal enlargement accompanied by cyanosis. Clinical examination revealed ascites. There was no hepatosplenomegaly.

Paracentesis was performed on 5th February, 1969 and some 500 c.c. of chylous fluid was obtained.

Laboratory and X-Ray findings were as follows:

1. Urinalysis repeatedly normal.
2. Blood count and picture.

Hb: 13.4/100 ml: 91%. P.C.V.: 43%. 64%. Easinophils 4%. Basophils, Lymphocytes 24% Monocytes: 8%. Stained films: No abnormal features.

3. Bl. urea: 19 mg./100 ml.
4. Occult blood in stools: negative.
5. Agglutinins titration — negative.
7. The chylous fluid was examined

a) bacteriologically: no pathogens were detected.

b) biochemically and histologically:
Total fluid cholesterol: 85 mg./10 ml.
Total extractable fats: 2.4 g./100 ml.
Total fluid proteins: 4.3 gr./100 ml.
Fluid albumen: 3.2 gr./100 ml.

Electrophoresis revealed practically the same absorption of protein fractions in the fluid as in normal serum with only a marked lower concentration in the γ fraction.

The cytological appearance was homogeneous with the presence only of mononuclear cells belonging to the 'lymphocyte' series; scattered between the more numerous, larger and less mature lymphoid elements were many small mature lymphocytes, with homogeneous deeply staining nuclei suggesting the possibility of giant follicular lymphoma.

The child was discharged to out patients on 19.3.69 and readmitted on 21.4.71 with recurrent abdominal disturbance.

On 16.5.64, he was transferred to the Isolation Hospital because he had measles. He also had gross ascites which was embarassing his respiration. On 5.5.69, 500 c.c. of white chylous fluid were removed. He continued to leak for 3 days. On 25.5.69, he had recovered from his measles and was transferred back to the paediatric ward.

The patient was transferred to the Hospital for Sick Children at Great Ormond Street, London on 17.6.69 The possibility of a blockage of the lymphatic duct system was entertained. There it was found that the chylous effusion was not an ascites but a large cystic mass. The child was operated on by Mr. H. Nixon on 2.7.69. A large unilocular cyst about 8 × 6" was found situated in the transverse mesocolon and extending up posteriorly behind the pancreas. The cyst was between the leaves of the mesocolon. Its own wall was delicate and thin like the wall of a lymphatic vessel, so that it was impracticable to excise the cyst wall completely. The cyst was therefore marsupialised and two large tubes placed within it. The drains were left in for 14 days post-operatively, using suction for the first 4 days. There was no evidence of re-collection of fluid so the drains were removed.

He returned to Malta on the 20.7.70. Part of the operation wound was infected and kept discharging pus for some time. He was discharged well on the 29.7.70.

The diagnosis was of a large unilocular lymphatic mesenteric cyst and there was no evidence of any other abnormality of the lymphatic system.

Comment

The rarity of primary retroperitoneal tumours is generally accepted. The incidence may be gauged by the fact that over a 30 year period between 1930 and 1960, 101 cases were treated at the Lahey Clinic while at the Memorial Hospital in New York between the years 1926 and 1951 there were 120 verified cases. 30 cases were left unverified. This latter series which is the largest reported from any

one institution represents an incidence of 0.2% when one takes into account that throughout this 26 year period 60,000 patients with tumours were seen. Incidence seemed equal in both sexes.

The evil reputation which they have is on the whole well deserved. 85% of the New York series were malignant, as were 88 cases of the 101 from the Lahey Clinic. In Donnelly's series 91% were malignant.

The lymphomas constitute the largest group amongst the malignant neoplasms. Fully a third of the tumours reported from the Lahney Centre were of lymphatic node origin, while 24 of the 120 from the Memorial Centre were classified as lymphomas.

However of these, the reticulsarcomas form the least common type, the lymphosarcomas being the most frequent.

Most workers agree that the diagnosis is not easy. Enlargements of the kidney, adrenal, pancreas, spleen and liver have to be excluded, as also such lesions as aortic aneurysms. The tumours may arise from anywhere from the diaphragm to the pelvic floor, and from a wide veriety of tissue such as fat, areolar tissue, connective tissue, fascia, muscle, vascular tissue, nerve tissue, somatic and autonomic, lymphatic vessels and lymphatic nodes. Only a minority are hormonally active tumours. These include the extra- may here be made of the hypoglycaemia and its associated symptoms occasionally seen with retroperitoneal sarcomas. This was not seen in the two large series quoted above. (47 Fibro Sarcomas; 4 Neurofihomas).

Up to 1966, 145 patients were reported showing this phenomenon.

The most common *clinical* finding is an abdominal mass. Pain is generally present; it is ill localised, it may be felt in the back but is not often severe when the patient presents. Gastro-intestinal symptoms may be remarkably inconspicuous even in the patient with a huge abdominal mass as was seen in our second case. Anorexia, weight loss, and constipation are commonly complained of, less frequently vomiting and haematemesis. This latter may be the result of portal congestion from extrinsic compression. It is rarely due to direct involvement of stomach or intestine. Haematuria is a very rare early symptom; it was present in profuse degree in our first case.

With regard to special investigations all agree that the most useful radiological study is an intravenous pyelogram. AP and lateral views often show displacement of kidney and/or of the ureter.

A gastro-intestinal series is also very useful to show displacements and thus afford evidence as to precise location of the tumour. Newman & Pindi reckoned they were "sufficient to establish a diagnosis".

In our cases, I.V.P. did point to involvement of the left ureter in the first case and in the second the man had displacement of the left ureter and the diffuse spotty calcification afforded clues as to the nature of the mass in question.

Other X-Ray procedures which may provide highly useful information are aortography and lymphangiography. Perirenal insufflation is not without its dangers and pneumoperitoneum is not helpful. A preoperative diagnosis may be arrived at in about 30 to 40% of cases. However, there is no substitute for exploratory laparatomy to reach a definitive histological diagnosis in order to determine resectability.

Knowledge of the state of the renal tract, the previous lavage and sterilization of the intestinal tract and the availability of considerable quantities of blood are useful prerequisites to successful surgical treatment.

Our second case required to be transfused with 6 pints of blood over the operation and also necessitated a caecostomy as a safeguard following inadvertent contusion of the mesocolon.

The mortality rates reported in the larger series in the literature is not inconsiderable. A 10% mortality and a 22% morbidity rate was present in the Lahey Clinic series, among the malignant group.

Radiotherapy plays a primary rôle in the treatment of lymphomas. With other tumours, it has a subsidiary rôle. According to Pack and Tabak, Myxosarcomas are only slightly radio-sentitive. However, it

is generally considered that radiotherapy should be offered to all cases of tumours not amenable to resection and to those that are not for technical difficulties excised completely.

To conclude: primary retro-peritoneal tumours, though uncommon, are not great rarities and should not be neglected. They merit more notice than is generally given them in the odd half page of the standard surgical text book. They pose a difficult and fascinating problem to the pathologist and to the physician. To the practising surgeon they are a challenge that may tax his resource. In dealing with them, though he can often only bring to his patient temporary relief, he is occasionally rewarded with a gratifying outcome.

EMOTIONAL AND PSYCHOSOMATIC DISORDERS IN GENERAL PRACTICE

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Summary:

The incidence of psychosomatic and emotional disorders in general practice was recorded and found to corroborate the findings of other authors. Psychotropic events were correlated to psychosomatic illnesses.

Any practising physician will necessarily be confronted with a certain proportion of patients who seek medical advice for emotional reasons having no apparent organic disease. Though it seems simple to classify illnesses into organic and emotional or psychosomatic, it soon becomes apparent that at certain times it is very difficult to draw a dividing line. It is obvious that organic illnesses generate emotional disturbances and emotional disturbances generate organic illnesses. The knowledge of the genesis of emotional and phychosomatic illnesses is of paramount importance in medicine. This paper is an attempt to obtain a perspective of the problem as it presents itself to the general practitioner. It consists of (a), a study of the incidence of emotional and phychosomatic illnesses in general practice, and (b) of a study of the causes of such illnesses.

950 cases were studied consecutively in the month of November, 1969 as they attended the office. Each patient, on coming to the office, for whatever reason, would have his name taken down and listed on a special chart where he would be classified as to age, presenting symptom, diagnosis, race, education, civil status, religion and medication received whilst miscellaneous items relating to his medical and social history would be noted. These cases were gathered in sixteen working days. These consultations would include some patients that would come weekly for an allergy injection as well as those that would come for a certificate for work. Some other patients would be included twice, being cases of injuries sustained at work who would be seen once a week for follow up. So inevitably some visits would be very cursory. Many of these patients would have been known beforehand and their previous histories would have been recorded, thus making a quicker appraisal possible.

The main object of this first stage of

the study was to sift those adults that were suffering from emotional disorders. Very few patients would present with a depression, anxiety state or just bad nerves. A larger percentage would present with a somatic complaint. Those patients that were suffering from an emotional disturbance as a result of an organic disability were excluded from the group. Amongst these would be included those patients who had suffered a coronary thrombosis or were suffering from cancer or from other prolonged illness. It is natural that such patients should suffer from emotional repercussions after such an event. What is not equally clear to many is the fact that such events generate emotional upheavals amongst close kinsmen. These emotional upheavals result from grief, can occur in dependents experiencing financial difficulties and in persons closely related to the event, experiencing other social repercussions.

For example when the father of a family is hurt at work or elsewhere, this would cause emotional disturbances not to himself alone but also to his wife and children with varying intensity, emotional effects being felt also by his friends and by other associates to a varying emotional extent. These emotional upheavals in the next of kin can generate a certain amount of organic illness. Many individuals would overcome the crisis without seeking medical advice, but others will present to the doctor as epigastric discomfort, or spastic colitis, or tachycardia etc.

A case would be classified as psychosomatic on 3 conditions:

(1) The condition must belong to one of those listed as possibly psychosomatic.
(2) The patient must admit to an emotional disturbance.
(3) The emotional disturbance must precede the somatic condition.

The first 950 patients, including infants, seen in the first sixteen working days in November, 1969, were classified as already described, but no diagnosis of psychosomatic illness was attempted on children under 15 years of age. It is recognised that children of all ages, from infancy onwards can suffer from symptoms of stress and emotional disturbances, but these would require a different perspective and woul be better dealt with as a separate series.

This group of patients consisted almost entirely of new Canadians, whose stay in Canada varied from a few months to twenty years. Many of these patients had some English language difficulty.

The patients examined consisted of:

Children (under 15)	230
Males (over 15)	325
Females (over 15)	395

Incidence of nervous and psycosomatic disorders:

Males (over 15)	71
Females (over 15)	140
Total	211

		Incidence	%	
Males	325	71	21.8%	
Females	395	140	35.4%	
Total	720	211	29.3%	M. 9.8%
				F. 19.4%

Events and psychosomatic illnesses

In this survey an attempt was made to trace the relationship between life events and emotional illness. It is quite clear that we are continuously influenced by events. The fact that there is a war in South Vietnam is an event. The psychotropic effect that this war is causing or has caused on the Vietnamese people is obviously different from its effect on the American people and again different from its effect on the Canadian people. It is quite possible that some people around the world are not even aware that a war is going on. In such a case there would be no mental effect at all. So we may safely say in general terms that there are many events happening all around us, many of which we are not even aware of, some of which do not concern us at all, others still that strike home. It is with the latter that we are mostly concerned in this paper. There are some events which occur within the family group which are very momentous and generate emotional conflicts. These are events that may happen

Classification of certain conditions with reference to psyychosomatic status.

	Excluded	*Included*
Skin reactions:	Urticaria	Neurodermatitis
Musculoskeletal reactions	Backache	Tension Headache
	Rheumatism	
Respiratory reactions	Asthma	Hiccups
	Hay fever	
Cardiovascular reactions	Vascular spasm such as angina pectoris	Migraine
		Labile or reversible hypertension
	Coronary thrombosis	Tachycardia
		Arrhtymia
Gastro-intestinal reactions		Ulcer
		Anorexia nervosa
		Nausea & Vomiting
		Spastic Colitis
		Ulcerative Colitis
Genitourinary reactions	Menopausal flushing	Dysmenorrhea
General physical conditions		Neurasthenia
		Tremors
		Palpitations
Mental reactions		Insomnia
		Irritability
		Loss of interest
		Confusing thoughts
		Apprehensive dreams
Endocrine reactions	Thyrotoxicosis	
	Hypothyroidism	
	Obesity	

to any family and there are many of them that must happen to all of us and yet though we are aware that such events should occur we find ourselves ill prepared to meet them when they do happen.

An event is defined as a "happening or an occurrence". This implies a beginning. It also implies a duration, which is a variable. Some events last a very short time, others last longer and others still are chronic. The event may therefore have an ending or it may be such that its ending may not be in sight. The seriousness of an event is also a variable. What we are concerned with here is not merely a list of all the possible significant events that may influence an individual, but those occurrences which strike at a person's innermost constitution. These events we shall label as Psychotropic Events, and we shall divide them into acute or chronic. By definition psychotropic events can never be neutral in effect. They may either be traumatic, if noxious, or euphoric, if pleasant, or mixed. A pleasant life is usually built from day to day by a balancing of the traumatic with the euphoric events. It is when some unusual and un-

expected traumatic event occurs, that the individual is thrown out of balance and in some cases falls ill.

A group of 134 patients were chosen and asked to answer a series of 60 questions. The patients were divided into two groups. The first group consisting of 77 patients who were suffering from what was diagnosed as psychosomatic illnesses; the second group of 57 persons were patients who did not seem to have any emotional disturbances and had come to the office for some other reason, such as pregnancy, a minor injury, a minor cold etc. In this survey all the patients were questioned as to the incidence of recent or chronic events, as well as to their hobbies or tension relief events. The score was recorded per patient.

The following is a list of the events, divided into 3 groups, on which the patients were questioned:

(A) — Acute Psychotropic Events (Events that occurred within 2 years)

1. Change of residence.
2. Change of health in a member of the household.
3. Personal injury or illness.
4. Immigration to Canada.
5. Separation from parents and siblings.
6. Death of a close friend.
7. Death of a parent or close relative.
8. Taking on a major debt, such as a motgage or loan.
9. Promotion at work.
10. Change to a different kind of work.
11. Son or daughter leaving home.
12. Demotion at work or loss of a job.
13. Retirement.
14. Separation or divorce.
15. Arrest and/or court conviction.
16. Business and financial setbacks.
17. Family and in-law squabbles.
18. Pregnancy.
19. Marriage.
20. Birth.
21. Began or ended school.
22. Menopause.
23. Inter-racial marriage.

(B) — Chronic Psychotropic Events

1. Chronic illness of a member of the family.
2. Chronic illness or disability of person concerned.
3. Tight finances.
4. Homosexual spouse.
5. Involuntary lack of children to married couples.
6. Teenagers in the home.
7. Alcoholic spouse.
8. Separation from parents or next of kin.
9. Parents died over five years ago.
10. Parents do not get along.
11. Husband and wife do not get along.
12. Bachelorship or spinstership.

(C) — Hobbies or Tension Relief Events

1. Fishing. Summer or Winter.
2. Sports. Games. Outdoor or Indoor.
3. Visiting friends or relatives.
4. Cinema.
5. Theatre.
6. Watching television at home.
7. Reading.
8. Craftwork at home.
9. Daily alcoholic drink with meals or in the evening.
10. Playing a musical instrument.
11. Card games.
12. Music — records or radio.
13. Dancing.
14. Membership in a club.
15. Other hobbies.
16. Social gatherings — weddings, parties.

The following is the score obtained by the psychosomatic cases and the control group:

Psychosomatic Cases	*No. of Events*	*Acute*	*Chronic*	*No. of Tension Relief Events*
77	362	204	158	303
Average	4.70	2.6	2.05	3.9
Control Group				
57	187	127	60	256
Average	3.28	2.23	1.05	4.5

Analysis of the incidence per event.

(A)	Acute Psychotrapic	Psy. Grp.	Per cent	Control Grp.	Per cent
1.	Change of residence	36	18	23	17.5
2.	Change of health in a household member	17	8.5	4	3
3.	Personal injury or illness	7	3.5	14	13
4.	Immigration to Canada	18	9	12	9
5.	Separation from parents and siblings	20	10	11	9.5
6.	Death of close friend	10	5	1	0.8
7.	Death of a parent or close relative	10	5	1	0.8
8.	Taking on a major debt, mortgage or loan	20	10	12	9.5
9.	Promotion at work	1	0.5	1	0.8
10.	Change to a different kind of work	6	3	7	5.6
11.	Son or daughter leaving home	7	3.5	1	0.8
12.	Demotion at work or loss of a job	10	5	0	0
13.	Retirement	1	0.5	0	0
14.	Separation or divorce	10	5	8	6.4
15.	Arrest or court conviction	1	0.5	3	2.61
16.	Business or financial setbacks	0	0	0	0
17.	Family and in-law squabbles	2	1	0	0
18.	Pregnancy	9	4.5	3	2.3
19.	Marriage	8	4	7	5.6
20.	Birth	12	6	4	3
21.	Began or ended school	0	0	4	3
22.	Menopause	7	3.5	0	0
23.	Inter-racial marriage	2	1	0	0

In analysing the figures the first impression seems ta be that there are more events happening to psychosomatic patients than to the control group. In analysing the figures further we find that the average for the psychosomatic and the control group as far as the acute events are concerned is about the same, while the average chronic events is higher in the psychosomatic group than in the control group. The reason that the acute events are about equal in the two groups is ob-

(B)	Chronic Psychotrapic Events	Psy. Grp.	Per cent	Control Grp.	Per cent
1.	Chronic illness of a member of family	12	7.5	4	6.7
2.	Chronic illness or disability of person concerned	3	2	8	13
3.	Tight finances	55	35	25	41.5
4.	Homosexual spouse	1	0.63	0	0
5.	Involuntary lack of children to married couples	0	0	2	32
6.	Teenagers in the home	2	1.26	3	48
7.	Alcoholic spouse	7	4.41	1	1.6
8.	Separation from parents or next of kin	10	6.3	0	0
9.	Parents died over 2 years ago	1	1.63	0	0
10.	Parents do not get along	30	18.9	7	11.2
11.	Husband and wife do not get along	14	8.82	4	6.4
12.	Bachelor or spinster	9	5.67	3	4.8

viously because the control group came to the office for a medical event such as a pregnancy, an injury etc. If the control group were picked up from the general population the score of the control group would obviously be lower.

The tension relief events hit about the same average in both groups. Again this is to be expected considering that both groups come essentially from the same ethnic background, having the same cultural and social status. There is however, a slightly higher occurrence of tension relief events in the control group.

Discussion:

An attempt was made to find the incidence of emotional illness in general practice. This was found to be in the region of 22% for men and 35.4% for women. On comparing the results of other authors (Coats, a 1969; Coats, b 1969; Kessel and Shepperd, 1962; Kessel, 1965; Mazer, 1967; Roessler, 1961; Rowen, 1960; Silverman, 1968; Watts and Cawte, 1964), observations were found to be essentially similar except for the fact that these illnesses were labelled as neuroses by these authors. The term neurosis has been avoided in describing these patients as the term seems to have a morbid personality connotation which seems to imply a certain degree of frustration on the part of the doctor in handling these patients. It is felt that these patients are ordinary citizens in the grip of the currents of human civilization and facing the hard facts of life. Their symptoms are only an expression of the uncontrollable reactive processes that automatically occur within the body as a result of psychotropic events. What the physician sees in his office from behind his desk is only a snapshot of a phsiological reaction in a process of resolution. Hence

the frustration of the physician when prescribing the usual antacid and antispasmodic for the symptomatic relief of gastric symptom caused by the fact that the worker has been laid off from his work. These emotional problems should not be considered as merely functional and therefore not requiring treatment, as they would otherwise lead into actual organic illness, which would naturally satisfy the organic oriented doctors. It is true that many events correct themselves in time. The worker who loses his job may find a better one. It is therefore important to enumerate the events in his history when assessing the medical status of a patient. Medication and advice should be given accordingly. The human biological reaction may be presented in this manner.

Event > Emotional disturbance > Somatic disturbance > Actual organ pathology.

A list of psychosomatic illnesses has been given. Many conditions that are questionably psychosomatic such as bronchial asthma, thyrotoxicosis etc., have been deliberately omitted; other conditions that are still possibly psychosomatic have not been even mentioned, such as repeated respiratory infections.

The score on events among the two groups was found to be moderately higher in the psychosomatic group. It is obvious that man is capable and prepared to cope with a certain number of unpleasant events, but there are a few events which, when they occur, cause a break in the adaptive processes of man. According to this survey the catastrophic events are:

Ill-health in a household member
Bereavement
Son or daughter leaving home
Demotion or loss of a job
Menopause
Alcoholic spouse
Separation from parents or next of kin.

These are events that actually happen to most people at some time or other. Yet we seem to be so unprepared for them when they do happen. It would appear that mental provisions should be laid out in preparation for such events. The tension relief events, one notes the lacè of ly poor in both groups. Considering tension relief events one notes the lack of physical exercise especially in the female population. The mental stimulation and the physical well being engendered by physical exercise or sporting activities seem to have been missed by this group of persons.

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HEALTH SERVICES IN THE U.S.S.R.

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As Malta's participant at the recent World Health Organization Advanced Course in Health Planning held in the Soviet Union, I had the opportunity of observing certain characteristic features of the Soviet public health system. This W.H.O. course was attended by twelve advanced students from various European countries, with lectures delivered mainly by Russians and, to a lesser extent, by other foreign experts. The teaching was primarily in English, and partially in Russian. The full course lasted 2 months, including an interesting trip, for field work, to the Republic of Moldavia, in the South-West of the Union of Soviet Socialist Republics. The curriculum provided for lectures, practical and seminar work, discussions on various widely diverging topics such as the theory and organization of medicare, health planning, and health economics. The course was run jointly by the U.S.S.R. Ministry of Public Health, and the Central Institute for Advanced Medical Training, Moscow where all the lectures took place.

Health services in the U.S.S.R. are organized to meet the requirements of a specific social system and philosophy, and are designed to provide comprehensive medical care for the whole population through the integration of curative and preventive services at all levels of administration. The basic health philosophy is one of "prophylaxis" by health protection, and it places the responsibility for the health of the people on the State. The Soviet Government has recognized the rôle played by health in a nation's economy and development, and the fact that certain population groups (e.g. children, workers, etc.) require specialized medical attention. The existing health services of the U.S.S.R. are the result of 40 years of development, experiment, and research. The complicated structure evolved in this way consists of a number of institutions and functional units so interlocked that the result is a unified system embracing all health disciplines and reaching into every locality in the 15 constituent republics, to the smallest and most remote villages and farming areas. The basic principle of this structure is highly centralized planning and supervision, coupled with some complete executive and operational decentralization permitting the majority of problems to be dealt with at local levels, without disturbing the general and basic pattern.

Salient Features

Republican territories are subdivided into *oblasts,* which have autonomous health departments. The oblasts are subdivided into regions *(rayons)* and these in turn are further subdivided into health districts or sectors. The large cities have their own health departments, and they also are divided into rayons and health districts.

The regional health organization of the U.S.S.R. at the operational level is perhaps one of the most remarkable achievements of the Soviet health system. The *rayon* (or regional) hospital offers comprehensive and integrated health care, both for in-patients and for out-patients. It is responsible for the regular health screening of the entire population, and for the follow-up treatment and surveillance of specific conditions. This screening and follow-up method is known as "dispensarization". The rayon hospital is also responsible for environmental sanitation and epidemiological control of communicable diseases in the area, through a

network of sanitary and epidemiological stations. The health officer responsible for the whole area is the director of the rayon hospital, while his first deputy is in charge of sanitation and epidemiology. The rayon health unit (hospital, out-patient clinic and sanitary epidemiological station) is aided by a network of units ranging from the district unit, headed by a district doctor, to the smallest local health unit, the so called feldscher-midwife station. The districts have small cottage-type hospitals (*uchastock* hospitals), maternity homes, and preventive-curative stations in villages and farming areas.

Medical Care in Rural Areas

The most numerous rural health establishments — the outposts of the health services in the villages — are the feldscher-midwife posts. Medical out-patient and in-patient services are also provided by district hospitals. The basic types of specialist medical care are provided by the rayon hospitals. Finally, highly-skilled specialised in-patient, out-patient and advisory services are the responsibility of the oblast hospitals and specialised follow-up centres.

The basic rural medical establishments are the feldscher-midwife posts, staffed by a midwife, a feldscher and a nurse. It is usually a separate building, with two or three beds for normal deliveries. The main function of these posts is the provision of predominantly out-patient services for the population. In this case the feldscher acts as an assistant-doctor. In cases with which he is not capable of dealing himself he sends the patient to the nearest district or rayon hospital. Other functions of these feldscher-midwife posts are to improve conditions of sanitation and hygiene, to carry out environmental health measures, to carry out prophylactic work, and, most important, health education among the community. Generally, each feldscher-midwife post operates in a village with a Village Soviet (which is the primary local government body) and serves three to four villages, i.e. 300 to 900 people, depending on the locality. In addition to these posts, there are also permanent and seasonal day nurseries, pharmacy stores, and collective-farm maternity homes.

Each rayon is then divided into a number of medical districts. The population of a rayon varies between 20,000 to 120,000 whilst each district contains between 7,000 - 12,000. The centre of a medical district is the district or *uchastock* hospital, having at least 35 beds. These district hospitals are a centre of primary specialization, having a minimum of four specialists: therapist or general medicine specialist, surgeon, gynaecologist, and a specialist in infectious diseases, besides a dentist. Each hospital provides an out-patient and in-patient service, the most important function being the provision of advisory services. Thus each doctor in the district hospital has a schedule of visits to feldscher-midwife posts.

The next level is the *rayon* hospital, having at least 100 beds, and is a centre providing skilled medical assistance. Thus, it also has E.N.T., paediatric, neurological and some other units. The polyclinic department, which is usually integrated with the hospital, not only provides curative and preventive services, but also serves as an advisory centre for all medical establishments in the rayon. Finally, the highest level is the *oblast* hospital, usually with 460 - 500 beds; occasionally, 1000 or more beds. The oblast hospital is a centre providing highly-qualified and specialist services. The polyclinic again serves as an advisory centre.

Medical Care in Urban Areas

There are three levels of medical care:

(a) specialized central institutes;
(b) rayon (city) hospitals;
(c) district units, each with about 3000 adult inhabitants.

The leading figure in the organization of polyclinic services in the district units is the district physician. The district principle makes it possible to carry out a whole range of curative and prophylactic measures, to detect disease in its early stages, and to give active treatment and to take any sanitary measures.

The polyclinic provides all the basic forms of specialized care, domiciliary services and emergency services. Reflecting the general tendency in modern public-health practice towards further specialization, the polyclinics have now begun to open cardio-rheumatological, gastro-enterological and other specialized units.

The leading method used in the polyclinics is the follow-up method — "Dispensarizations". In addition to treatment, it entails the use of extensive measures of individual and social prophylaxis, ensures that the health of the population in the medical district concerned is kept under regular observation, and leads to the detection of disease in its early stages and the use of combined therapeutic and prophylactic measures to deal with it. This follow-up system covers people suffering from many groups of diseases (cardiovascular, chronic disease of the gastro-intestinal tract, chronic nervous disorders, etc.) and also certain population groups independently of occupation, such as children, pregnant women, and school-children.

Besides the polyclinic departments of the combined hospitals and the independent polyclinics, a considerable volume of out-patient work is carried out by specialized follow up centres ("dispensaries"). There are tuberculosis-control centres, cancer-control centres, and centres for the control of skin and venereal diseases, trachoma and goitre, and for physical culture therapy.

These centres usually include specialized in-patient and out-patient departments, giving all types of curative and preventive care. The centres work on the district principle and are responsible for carrying out in the area they serve a full range of prophylactic measures against the diseases they cover, for regular surveillance of the people's health and for early detection, registration and prompt treatment of cases.

In the Soviet public health system a very effective network of first-aid and emergency services has been established in close cooperation with the hospitals and polyclinics. In large cities this service is provided by special establishments — first-aid stations — and an emergency service is provided by emergency departments in the polyclinics. In smaller towns both services are combined in a single establishment, the first-aid and emergency station. The ambulances are equipped with modern apparatus and instruments for blood transfusions, artificial respiration, electro-cardiography and other urgent procedures, thus making it possible to give the necessary treatment on the spot or on the way to the hospital as a specially-trained doctor goes out in answer to the first call. They are usually equipped with two-way radios to keep in contact with the dispatcher at the first-aid station.

Hospital Beds and Polyclinical Aid

The Soviet system, in all its various spheres, is geared on a tight assessment or norms, and their public health planning and standards are necessarily based on normative standards. On the basis of these standards it is then possible to determine the values and indices in public helath plans, and the correct ratio between certain specialities. The following table gives an indication of the standards

SPECIALITY	Per 1000 of child pop.	Per 1000 of all pop.
Surgery and orthopaedics	0.8	0.2
Otolaryngology	0.5	0.125
Tuberculosis	0.5	0.125
Neurology	0.12	0.03
Ophthalmology	0.12	0.03
Cardiology	0.05	0.0125
Child gynaecology	0.08	0.2
All the others	0.53	0.1325
Psychiatry	0.5	0.125
Psycho-somatic	4.8	1.2
TOTAL	8.0	2.0

of specialized Beds (from the general standards) per 1000 of all the population and per 1000 of children population (with 25% children population in the country).

The next table gives the standards for the urban population's requirements for out-patient on polyclinical aid calculated at a rate of ten visits on an average per person per year:—

Speciality	*Average number of visits*
Therapy	2
Surgery	1.5
Otolaryngology	0.4
Ophthalmology	0.5
Dermato-Venereology	9.7
Tuberculosis	0.7
Neurology	0.4
Obstetrics/Gynaecology	0.9
Paediatrics	1.2
Stomatology (dental treatment etc.)	1.7
Total	10

From such data it has been worked out that doctor/patients contacts/year amount to 6 visits, and the future plan is to increase this figure to 9 visits/year.

Medical personnel

At the end of 1970 there were 31.8 doctors per 10,000 population in the U.S.S.R., and the target is to have 35 physicians per 10,000 population. Of these 25 per 10,000 will be for ambulatory services, whilst 10 per 10,000 will be for the in-patient hospital services. Female doctors total no less than 73%.

The following table shows the norm (work-load) of an out-patient doctor per 1 hour:

Speciality	*No. of Doctor-Patient Contacts/Hour*	
	at Polyclinic	*at home*
Therapy	5	2
Surgery	9	1.25
Traumatology and Orthopaedics	7	1.25
Urology	5	1.25
Oncology (— cancer)	5	1.25
Paediatrics	5	1.50
Obstetrics/Gynaecology	5	1.25
Ophthalmology	8	1.25
Otolaryngology	8	1.25
Dermato-Venereology	8	1.25
Tuberculosis	5	1.25
Neurology	5	1.25
Psychiatry	4	1.25

Maternal and child health

This is regarded as most important in the U.S.S.R. and this policy is reflected in that both programmes are to be found permeating the general health services at all levels.

The women's consultation centres provide the most easily accessible and widespread form of maternal health by keeping a constant watch on expectant mothers throughout the entire period of pregnancy. On the average each pregnant woman visits the doctor 6-8 times during a pregnancy. During 1970, 98% of maternity cases in the U.S.S.R. were admitted to maternity homes (as independent entities or as the obstetrical department of a hospital). In urban communities 100% of deliveries took place in institutions, whilst the comparable figure for rural areas was 82%. Average length of stay after deliveries in urban is 10-11 days, and in rural areas 6 days. Legal provision is made for adequate maternity leave, both antepartum (56 days), and another 56 days postpartum. It is well to point out that all women are at work.

The main establishment providing medical services for children are children's hospitals and children's polyclinics, while creches, children's homes and kindergartent help in bringing up the younger children. The children's polyclinics keep all babies and infants under regular observation, and carry out many different kinds of sanitary and prophylactic work, home visiting, regular examinations, etc. and all types of curative treatment. Schoolchildren are also looked after at school itself by the school doctors. Small children, up to the age of 3 years, are cared for in permanent creches or nurseries, and there

are also a number of seasonal creches. In some areas up to 30% of these children are admitted to permanent nurseries as all the women (up to age 60) have to be at work. Some of these children stay in the creches, and are only taken home by their parents during weekends.

Vaccination against smallpox and B.C.G. are compulsory in the U.S.S.R. Immunization with triple vaccine, and against poliomyelitis are carried out as routine measure, and the child population is for all practical purposes fully immunized. B.C.G. is given at the first 3 days of life, and smallpox at 10-12 months. In between, D.T.P. is given.

Occupational health

This is apparently given an important place in the public health programme to keep pace with the rapid industrial development of the country. There are at present 12 institutes of industrial hygiene and occupational diseases under the control of the Ministry of Health. In addition, the All-Union Council of Trade Unions controls six institutions of labour protection.

The institutes of industrial hygiene and occupational diseases are engaged mainly in experimental and research work, both basic and applied. They all participate in the formulation of codes, rules and regulations for the protection of the health of the workers at the places of employment. These institutes also study the various types of industrial processes, with the object of changing the techniques and devising new methods and procedures for the health protection of the workers. They also have a few beds and act in a consultative capacity in regard to the diagnosis and treatment of occupational diseases. The institutes participate in the training of personnel by offering research opportunities to junior specialists and by providing refresher courses for factory doctors (sanitary industrial inspectors). The institutes of labour protection on the other hand, are mainly concerned with the improvement of industrial safety.

The occupational health programme is carried out by a network of medico-sanitary departments (health units) which have to be provided in all large plants and factories. In smaller plants ambulance rooms are provided. These health units are independent organizations and provide all health services needed by the employees. A unit consists of a hospital, an outpatient clinic, ambulance rooms, "prophylactoria" and creches. The head of these medical units is at the same time the head of the hospital.

The medical department in Soviet industry carries out the same functions as industrial medical departments in other parts of the world, and provides in addition a comprehensive medical care programme for the employees, and in some cases for their families as well. Special emphasis is placed on the following:

(a) Periodic physical examinations (which are termed prophylactic examinations) carried out by a special committee of all the specialists attached to the department.
(b) Safety committees, depending to a great extent on the active participation and support of the trade unions.
(c) Health education.
(d) First-aid organization. In each factory of 1200-1500 workers, 20 to 30 voluntary workers are trained in first-aid techniques.
(e) Physiotherapy and physical medicine are practised on an extensive scale and appear to receive much more attention than elsewhere in the world.
(f) Prophylactoria (day and night sanatoria), where workers in need of some medical supervision are accommodated during their free time, but still carry out their everyday work without interruption.

The number of medical and paramedical personnel employed in occupational health programmes is greater than the number usually found in other countries. For example, a plant employing 10,000 workers has 26 doctors and 161 nurses and nurse-aides, and a plant employing 20,000 workers (with 25,000 dependants) has 135 doctors and 853 paramedical personnel.

It is well to bear in mind that the budget of all health services in industry

is included in the total budget of the Ministry of Health.

Conclusion

I have highlighted the basic principles of public health services in the U.S.S.R. which presumably under the existing State system must be the best for this vast continent. The overall emphasis on centralisation and on the rigid normative standards which have to be followed must certainly have their drawbacks.

Naturally I visited a number of top Soviet establishments such as the Semashko Scientific Research Institute of Social Hygiene and Public Health Organization, the Institute of Clinical and Experimental Surgery, the Central Institute of Traumatology and Orthopaedics, the Gamaleya Institute of Epidemiology and Microbiology, Institute of Oncology, and various hospitals and polyclinics. But generally speaking I wasn't at all too impressed, maybe because I kept comparing their standards with the Scandinavian countries which I had visited earlier in the year. I saw quite a lot of overcrowding in the hospitals, where most of the equipment is rather poor and worn out, and where the diet is meagre, and has not shown any improvement since 1953. On an average patients seem to spend an excessively long time in hospitals, and some conditions, such as influenza have also got to be hospitalised because of the poor housing standards. When all is said and done I can honestly say that in a number of public health services we are better off than people in the U.S.S.R.

NOTICE

This periodical is published biannually in June and in December. Contributions for the December issue are to reach the Editor at the Bacteriology Laboratory, St. Luke's Hospital, Malta, by the 1st November. They must be typewritten, with double spacing. References should be given by the author's name and by the year of publication. Papers, which are accepted on the understanding that they have not been published elsewhere, are to consist of reports of original work or studies or case histories.

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MEDICAL NEWS

(continued from page 2)

Mr. A.H. Beckett, professor of pharmaceutical chemistry and head of the department of Pharmacy at the Chelsea College of Science and Technology of the University of London, visited the pharmacy department of the University having a very close look round. He also lectured, on the 12th May, on "The Effect of Drug Formulation on Biological Availability from Medicinal Products". There was a large and appreciative audience, mainly consisting of pharmacists. Interesting as it surely was for them this was the type of lecture attendance at which should be "required" for doctors. Professor Beckett also lectured on the 14th May, on "The Importance of steric and stereochemical features in biological action of drugs".

Dr. Wallace Gulia, acting for the Economics Department of the University, has organised a series of discussions on various aspects of medicine in Malta. One such, held under his own chairmanship, concerned "The general practitioner, the National Assistance Scheme, Welfare Officers and Hospitalization". Mr. P. Muscat of the Social Services Department, Mr. C. Messina, Almoner in the Health Dept., Dr. H. Grech Marguerat and Dr. Anthony Zammit were on the panel.

At another meeting the subject was "The Hospital Management Committee and the Advisory and Executive Board in relation to St. Luke's Hospital". Prof Joseph Galea was chairman, with Professor Walter Ganado and Mr. Joseph Muscat to answer questions. On the 22nd April "The Treatment of the Mentally Ill" was discussed by Dr. Paul Cassar, Dr. Abraham Galea, Dr. Joseph Pisani and Dr. Joseph Pullicino, under the chairmanship of His Honour Sir Anthony Mamo, with Dr. Alphonse Gerada as Rapporteur. "Private Hospitals" were the subject of a meeting on the 7th May, with Sister M. Aidan of the Blue Sisters Hospital, Mr. Raphael Attard, and Dr. Luis Vassallo on the panel, with Professor Griffiths as chairman.

Mr. Victor Amato and Dr. J.L. Grech have been elected President and Vice-president respectively of the "Medical Association of Malta"; Dr. Peter Fenech of Villa Chanticleer, Upper Gardens, St. Julian's is the Honorary Secretary.

Surg. Capt. J. H. Mercieca has been elected President of the Malta Dental Association for 1971-72; Prof. George Camilleri is the honorary secretary.

The Gothenburg Dentists Association held an intensive seminar on periodontal disease, between the 21st, and the 28th April, at the Preluna Hotel, in Sliema. Many of the leading Scandinavian teachers of the subject participated and the opportunity was taken to establish academic and social contact with their Maltese colleagues.

The tenth session sub-committee of specialists on blood problems of the Council of Europe met in Malta between the 24th, and the 29th. May. Dr. Francis Pullicino, government blood transfusion officer was the host on the Malta side. *Inter alia* many members of the medical profession had an opportunity of meeting the visitors at a reception given by the honourable Minister for Health in the newly restored main hall at the Health Department office. Although one could doubt whether this is the best use to which the hall could be put, there is no doubt that the Castellania Palace seems to have regained some of its old splendour. The party itself, at which local wines and even local pastry was served, had a welcome touch of originality, although we shudder at what could happen if emphasis on "being Maltese" should be allowed to get out of hand.

Dr. Vanni Cremona ('64) is back in Malta after working at the Royal Postgraduate Medical School at Hammersmith. Dr. Paul Grech ('49) of Sheffield, was in Malta for a brief visit in May, taking part in a seminar and speaking on "Placentography" and on "The Radiology of the Pylorus and the Duodenum".

Dr. Gordon Blake ('61), we are happy to learn, is in the Physiology Department of the University of Rhodesia, fitting in very well indeed in endocrinology research work.

We mourn the death of Dr. Joseph Azzopardi ('22), a pathologist who dedicated all his life to laboratory work. He

had a great fund of common sense which earned him many friends. Another distressing event was the untimely death of Dr. Carmelo De Lucca ('43), one of Malta's few real scientists. Mr. Mario Gauci, a great friend of his and a fellow naturalist, kindly accepted our invitation to write for us a description of his work as a biologist, which we publish in this issue.

At the University students keen on their anatomical studies have founded and launched the "Royal University of Malta Anatomical Society", with Prof. J. L. Pace as honorary president and Mr. R. Carachi as President. An inaugural lecture was given on the 17th March by Prof. Griffiths on "The History of Anatomy", which dealt with many known and some quite surprisingly unknown great men. At the end, Professor Griffiths was solemnly inducted as an Honorary Member of the Society. On the 4th May, Lord Gayre, of Gayre and Nigg lectured on "The Ethnology of the Maltese people".

The new X-Ray department at St. Luke's was opened by the honourable Minister for Health, Dr. A. Cachia Zammit, on the 30th March, in the presence of His Grace Archbishop Gonzi. It was a pleasant little ceremony permeated by an air of cleanliness and newness. The latter will pass off; we can only hope that the former will stay.

PUBLICATIONS LIST

The following are recent publications by graduates of our medical school:

GRECH, J.L. (With I.R.F. Brown) 1970. Separation and characterization of a foetal haemoglobin variant by means of isoelectric focussing. Life Sciences *10*, part II, 191.

GRECH, P. (With F.J. FLINT) 1970. Pyloric regurgitation and gastric ulcer. Gut., *11*, 735.

GRECH, P. (1970) A technique for assessing pyloric reflux. Gut., *11*, 794.

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BOOK REVIEW

General Microbiology. By R. Y. Stanier, M. Doudoroff and E. A. Adelberg. Macmillans: 55s. 1971.

This book of 872 pages, profusely illustrated and well supplied with diagrams and tables, is by two professors of the University of California at Berkeley, and by one from Yale. This edition has been almost entirely rewritten and extensively reorganised so that it is practically a different book from the first edition of 1957. It is excellently printed and very attractively presented with one broad margin, which often provides place for illustrations. It deals, as its name implies, only with the general aspects of microbiology, but, so vast has progress been in this field, especially as far as biochemistry and genetics are concerned, that an extensive book like this is needed to provide the basic knowledge. One of its merits is that it deals, though perhaps not in exhaustive detail, with algae, fungi and protozoa. Somewhat surprisingly it hardly deals at all with antibiotics.

The book does not have a medical slant and, in actual fact, I would hesitate to recommend it to the ordinary medical student whose curriculum is crowded enough already, but for anybody who would like to extend his knowledge or who would make a hobby of the purer side of a fascinating subject, this book is excellent.

E. A.

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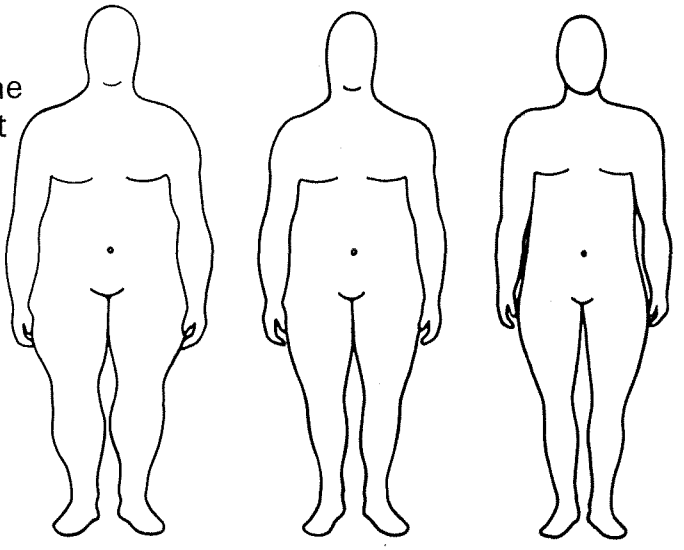

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4th Week and maintenance	2 + 2 + 2	2 + 2	1 + 2
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References:

1. Multi-centre clinical trials involving nearly 6,000 patients. Data available to the United States F. D. A. 1968.
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