

A SHORT HISTORY OF KANDANG KERBAU HOSPITAL AND THE MATERNITY SERVICES OF SINGAPORE

Y K Lee

ABSTRACT

This article traces the history of Kandang Kerbau Hospital ("the hospital beside the Bukit Timah Canal") and the maternity and infant welfare services of Singapore from 1858 to the present. This includes the development of teaching of Obstetrics and Gynaecology to medical undergraduates and postgraduates, and the training and registration of midwives, and the resulting saving of maternal and infant lives. Why was Kandang Kerbau Hospital converted into a Maternity Hospital in 1924?

Keywords: Maternal and infant mortality, Maternity and Infant Welfare services, Medical undergraduates and postgraduates, Midwives.

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INTRODUCTION

The district around the crossroads formed by Serangoon Road, Selegie Road, Bukit Timah Road and Rochor Road is known in Malay as "Kandang Kerbau" ("Buffalo Enclosure", because in the old days, there was a buffalo pen in the locality), in Teochew and Hokkien as "Tek Kah" and in Mandarin as "Zhujiào" ("Below the clumps of bamboo", because in the early days, clumps of bamboo grew on the hillocks in the district). This practice arose because the non-English educated local people had to select distinctive landmarks to identify the various localities in early Singapore, as there were no proper roads and addresses or they could not pronounce the English names.

Kandang Kerbau Hospital is today a maternity hospital. But it did not become one until 1924, although there has been a hospital at the same site beside the Bukit Timah Canal (which was originally a tidal creek) since 1858. Moreover, Kandang Kerbau Hospital was not the first maternity hospital to be founded in Singapore.

THE EARLY YEARS (I)

Why was this hospital beside the canal converted into a maternity hospital in 1924? What were its functions before that, and what part did it play thereafter in the development of the maternity services of Singapore which had started much earlier?

**Toa Payoh Hospital
Toa Payoh Rise
Singapore 1129**

Y K Lee, AM (S'pore), M.D., FRCP (Lond & Edin),
FRACP Senior Consultant
(Formerly Consultant Physician & Medical
Superintendent of Kandang Kerbau Hospital)

In 1858, a hospital was built at Kandang Kerbau which later became known as the General Hospital. It consisted of two sections. One, known as the Seamen's Hospital, was for Europeans, and the other, the Police Hospital, for the local people. (The original Seamen's Hospital was at Pearl's Hill, and patients were admitted to the new hospital when it was ready for occupation in 1860.) Built at the same time, next to the General Hospital, was the Lunatic Asylum.

In 1870, in an attempt to control the spread of venereal diseases, the Contagious Diseases Ordinance was passed. This Ordinance, amongst other things, made the medical examination of prostitutes in brothels compulsory, and if diseased, their admission into hospital for treatment also compulsory. The examinations were to commence on 1 January 1873, and hospital accommodation had to be provided. So in 1872, the Female Ward of the General Hospital was converted into a Lock Hospital with 20 beds for the treatment of venereal diseases in women.

In July 1873, cholera broke out in the Lunatic Asylum and the surrounding Kandang Kerbau district. Patients from the General Hospital and the Lock Hospital were evacuated, those from the General Hospital to the Sepoy Lines, and those from the Lock Hospital to a rented house. The Lunatic Asylum at this time was very overcrowded, and after the General Hospital patients were transferred to the Sepoy Lines, "53 of the quiet and well-behaved lunatics" were moved into the empty buildings thus relieving much of the overcrowding!

After the cholera epidemic was contained, the women returned to the Lock Hospital but not the patients of the General Hospital. They remained at the Sepoy Lines because the authorities decided that the locality was more suitable, and that the General Hospital should be used to increase the accommodation of the Lunatic Asylum, and to supply more wards to the Lock Hospital.

An order was passed by the Governor in 1884 making the Lock Hospital a hospital also for the treatment of licensed prostitutes suffering from diseases other than

venereal diseases.

On 1 January 1888, the law was changed, and compulsory examination and treatment were stopped. The Lock Hospital was converted into a voluntary institution. Admissions fell and cases of venereal diseases increased. Efforts were made by the medical authorities to save the situation. An Outpatient Department was started in the Lock Hospital for the benefit of women who wanted treatment but did not wish to be admitted.

I will now deal with the history of the maternity services of Singapore and return to the hospital beside the Canal later.

FIRST MATERNITY HOSPITAL

The founding of the first maternity hospital came about in the most unexpected manner.

In early 1885, when there was a proposal to employ nuns from the Convent as nurses in the new General Hospital at Sepoy Lines, there was opposition from some of the prominent European inhabitants. They went so far as to petition the Secretary of State for the Colonies. The Secretary of State noticed that one of the arguments adduced against the scheme was that the nuns were precluded by the rules of their Order from dealing with midwifery cases. He noted that this did not constitute a valid objection as general nursing and midwifery could not be safely combined, said that he assumed that in Singapore, lying-in cases were separated and nursed entirely apart from others, and asked for more information about maternity hospitals and the practice of midwifery. When his despatch reached Singapore, the authorities were in a predicament as there were no facilities for maternity cases in the hospitals. In those days, women gave birth at home attended by doctors, midwives (mostly untrained), relatives or friends or were unattended. The maternity mortality rate and the infant mortality rate were high.

There was a flurry of activity, and the Governor replied to the Secretary of State stating that he agreed that there was a need of suitable provision for lying-in cases. He mentioned that in the past five years only two midwifery cases had come to the General Hospital, and that Dr Rowell, the Principal Civil Medical Officer, had already pointed out the advisability of erecting a separate Maternity Hospital, and assured the Secretary of State that steps would be taken to start the Government maternity services as soon as possible.

A building at the junction of Victoria Street and Stamford Canal opposite the Convent was converted into a maternity hospital. The upper storey was set apart for the accouchement of women. It had accommodation for 8 beds, 4 for Europeans and 4 for local people. It was opened on 1 January 1888, but had to close a few days later because the Municipal labourers in dredging the canal threw up large quantities of black foul-smelling mud next to the hospital! It was re-opened on 1 October 1888 but had no patients when the year ended. A Mrs Woldstein, a qualified midwife, was employed as Matron and Midwife, and resided on the premises. Drs Tripp and Leask were in charge of the Hospital.

Wives of non-Government servants were charged \$1.00 per day. Wives of Government servants drawing monthly salaries of \$100.00 and upwards were charged the same rate; below \$100.00 according to the salary of the husband. The poorer classes of Europeans, Eurasians and other local people were treated free.

The first patient was admitted on 2 January 1889 and was safely delivered of her baby. There were a total of 11 admissions in 1889 with 10 infants born alive and well. All 11 mothers made good recoveries.

Although the patients were few in the first year, the Maternity Hospital did supply a want and was to play a great part in the years to come, although its existence was precarious in the early years. It occasionally had to close when there was no staff, e.g. from 14 May 1890 to 13 October 1890 when the Matron resigned and no replacement could be found in Singapore, and had to be recruited from Madras. The hospital re-opened when Mrs Hennesey, the new Matron and Midwife, arrived.

In 1890, during the months when the hospital was opened, 8 confinements took place in it. All the mothers did well and the infants were born alive, although one was premature and died some days after its birth.

The first admission of an Asian patient took place in December 1890. She was an Indian; all other patients had been Europeans or Eurasians.

During 1891, 12 Indian women were admitted. Up till then no Malay or Chinese woman had applied for admission. With 13 Europeans and 4 Eurasians, the total admissions were 29. Out of the 29 admissions, 25 confinements terminated naturally and 4 had "praeternatural" (abnormal) labour, but in all cases, the mothers made good recoveries. Twenty-one boys and 8 girls were born - 24 full-term, 2 premature who died, 1 stillborn and 2 miscarriages at 20 weeks.

In 1892, the first Chinese patient was admitted into the hospital.

The first set of twins were born in 1893, but the case was complicated with interlocking of the heads at the pelvic brim. The first-coming child, already dead, was decapitated to allow the birth of the second who was born alive.

The manoeuvres that had to be performed for obstructed labour would be unbelievable to the modern generation of obstetricians - decapitation, craniotomy, cephalotripsy, evisceration.

The hospital grew in popularity and admissions increased yearly, but admissions dropped when hospital charges were increased from 1 October 1894 to make the hospital "pay its way", compounded by the fact that two midwives commenced private practice and charged fees lower than the hospital.

TRAINING OF MIDWIVES

In October 1894, during the debates in the Legislative Council on the Estimates for the next year, it was suggested that the Maternity Hospital should be used as a school for training local women as midwives.

Maternal deaths were first reported in 1894. Four out of 71 women who were delivered. One died of cardiac failure, the second of puerperal septicaemia, the third of pulmonary embolism, and the fourth of puerperal convulsions and coma.

The second set of twins to be born in the hospital was in 1894. Although the mother had postpartum haemorrhage, she and her infants left the hospital well. 1894 was also notable for another incident. An European patient was delivered twice in the hospital during the year - on 1 January and 5 December.

In February 1895, the Secretary of State wrote to say that the suggestion that the hospital be utilised as a

school for training local women as midwives was worthy of consideration. In October, after consulting the Principal Civil Medical Officer, the Governor replied that Singapore was "not yet ripe for an improvement such as this."

In 1895, the third set of twins were born, both females, one weighed 3½ lbs and the other 2¾ lbs at birth, and were discharged well after 13 days. There were two maternal deaths out of 56 deliveries.

Although training of midwives was not officially organised, in November 1895, an Eurasian woman, Mrs Ganno, joined the hospital as a "volunteer" to learn midwifery. The doctor in charge of the hospital reported that "she may be the pioneer of a class of women here, who, if they would only follow her example, might become a very useful and self-supporting section of the community."

1895 was also notable for another incident. An European woman was admitted for "feigned or imagined pregnancy" (pseudocyesis).

In 1896, there were 8 European midwives in private practice in Singapore.

In the same year, a number of prominent European women formed themselves into a committee of Visitors to the hospital. They paid regular visits to the hospital, supplied toiletries and pictures to decorate the walls. They also administered a sum of money placed at their disposal by one of the merchants of Singapore, and it was by means of this that they were able to provide certain comforts to the patients, and also to assist some of the poorer patients in the payment of their hospital expenses.

Mrs Ganno, the pupil midwife, "passed a creditable examination before a board of medical officers, and has received a certificate since the end of the year." Another pupil, Mrs Melson, (a nurse probationer), joined during the year.

The Secretary of State wrote in July 1897 that he noticed that the infant mortality rate in Singapore continued to be very high, about twice as high as in the United Kingdom, and asked again about the training of local women as midwives. The Governor's reply was that one Eurasian woman had qualified and another was at the moment under training as a midwife, and that the Principal Civil Medical Officer did not think that women of other races could be trained.

Throughout 1897, the Lady Visitors continued to give their unremitting attention to the hospital, and Lady Mitchell, the Governor's wife, sent flowers weekly, until she left the Colony at the end of 1899.

Work in the hospital increased year by year. Regarding the training of midwives, Mrs Melson received her certificate as a midwife in 1899, and Mrs Buridge and Mrs Thornley theirs in 1900.

In 1903, it was reported that "nearly 50% of the inmates were natives of India. No Malay woman appear to go to this hospital but the Chinese are beginning to come to it." Most of the European patients were wives of the soldiers of the garrison.

In 1904, one nurse probationer, Mrs Massabini, passed her examinations and was granted the Midwife's Certificate, and another, Mrs White in 1905. Miss Gurney, a nurse probationer, took her place and passed in 1906.

In 1905, the infant mortality was about 20% of the total death rate in the Colony causing great concern. The medical authorities were convinced that ignorance on the part of the mothers and guardians regarding infant

care had a great deal to do with the high infant mortality. Added to this was the lack of qualified midwives practising among the poor. The prevalence of venereal diseases also contributed to the high infant mortality rate.

There was a proposal in 1905 to erect a new maternity hospital on a better site as the existing one had become inadequate. The rooms were too small and there was no accommodation for the pupil midwives. One had to sleep in an empty room and the other at home while on duty. It was also predicted that with the new hospital, admissions would soon double, and that this would be useful in the teaching of medical students of the Medical School which had just been founded.

This was also the year when it was felt that the time would soon come when the practice of Midwifery and its regulation would be the subject of legislation, and that in anticipation of that time, it was desirable that the training of local women in the art should be begun forthwith.

In 1906, two probationers qualified as Midwives making a total of midwives trained at the Maternity Hospital at eleven. They were all Europeans or Eurasians. One was employed as the Matron of the Lock Hospital and others were "all enjoying good practice in Singapore and neighbouring places".

SECOND MATERNITY HOSPITAL

In May 1907, the need for a new Maternity Hospital was debated in the Legislative Council. The Colonial Secretary stated that the existing hospital with 11 beds was inadequate and too small. It was proposed to build the new hospital near the General Hospital at Sepoy Lines "on a site which is very favourable in many ways - air, drainage, room for extension and freedom from noise." Estimates and plans had been prepared and there would be accommodation for 29 patients; 16 beds for the local women and 13 for European patients. There would be three single-bed rooms, and two labour rooms. The admission policy of the hospital would also be liberalised. All doctors in Singapore would be permitted to treat their patients in the hospital. Applications would be registered in the order in which they were made, and if there was room for the patients, they would be taken in order of priority of application. The hospital would not be confined to any particular doctor, but would be opened to all doctors.

The estimated cost of the hospital was \$91,000.00. This expenditure was approved by the Legislative Council unanimously.

The Governor still had to get approval from the Secretary of State but he was so confident that he wrote on 12 June 1907:

"I have the honour to inform Your Lordship that the necessity for a new Maternity Hospital for Singapore has recently been forced upon my attention. The present hospital, which was founded in 1888, is housed in a building which formerly formed part of the old gaol; it has now become too small for the needs of the place and its situation is open to objection owing to the noise of the traffic prevailing in the neighbourhood. The need for a new and improved Hospital has also become urgent owing to the necessity of providing proper instruction in midwifery for the students of the local Medical School, some of whom are now in their second year of training.

I accordingly caused plans and estimates to be prepared for a new building on a suitable site in the vicinity of the General Hospital. The building which is estimated to cost \$91,000.00 will accommodate 16 native and 13 European patients and will comprise the usual offices, etc. with the exception of quarters for the nurses, who will be accommodated in the Nurses' Quarters attached to the General Hospital.

In view of the urgency of the matter, I brought it before the Legislative Council who, on the 20th ultimo, unanimously approved of the enclosed resolution. Tenders have been invited for the work which will be proceeded with at once and I trust that the action which I have taken will meet Your Lordship's approval."

On 10 July 1907, the Secretary of State replied that he approved the Governor's proposals for the construction of a new Maternity Hospital at Singapore.

In 1907, two nurse probationers (Mrs Gusii and Miss Careless) completed their training and passed their examinations, bringing the total of locally-trained midwives to 13.

1907 was also interesting in that the first Caesarean Section to be performed in Singapore was recorded. Also the admission of a patient who passed foetal bones per rectum:

"...There were 4 cases of Malposition; 3 being Transverse, 1 a Face position. One of the Transverse cases was transferred to the General Hospital for Caesarean Section with favourable result.

One case was admitted for observation, that of a woman who passed foetal bones per rectum. This was obviously a case of abdominal pregnancy going on to abscess formation bursting into the bowel. ..."

The hospital had no deaths during the year, "though as usual some cases were admitted in a very septic state. One case was so septic that it was judged to be advisable to close the hospital for a fortnight, from August 30th to September 14th". Those were the days when it was sometimes safer to give birth at home than to go to hospital.

In 1908, the infant mortality rate was still high. The Principal Civil Medical Officer announced:

".... With a view to effecting an improvement in this heavy mortality among infants, it is the intention of Government to bring in a Midwives Bill at an early date to make it compulsory for all women attending childbirth to hold a certificate of competency. A certain number of women are now being trained for this purpose and it is hoped that classes will soon be formed for teaching native women how to properly feed and rear infants. The only way of teaching native mothers to feed their children properly and the necessity of cleanliness, etc. is by first training the women who attend them in child-birth and through them educating the mothers."

The Maternity Hospital was closed on 20 November 1908 because the new Maternity Block at the General Hospital was completed. The new block was occupied on 1 December 1908.

The following announcement appeared in the newspapers:

GOVERNMENT MATERNITY HOSPITAL
NOTICE OF REMOVAL TO SEPOY LINES
AND SCALE OF CHARGES

The Maternity Wards in connection with the General Hospital, Sepoy Lines, will be ready for occupation on December 1.

No cases will be admitted to the Victoria Street Hospital after November 20, and any cases occurring between November 20 and December 1 will be received into the Female Wards of the General Hospital.

Full particulars as to charges, etc. may be obtained on application at the office of the Principal Civil Medical Officer, Singapore.

Colonial Secretary's Office
Singapore, November 20, 1908

The block was separate from the other buildings of the General Hospital with its own kitchens, bathrooms, etc. There were 12 rooms and two labour rooms. 8 rooms were on the first floor, of which 5 contained two beds each and 3 one bed each; 4 on the ground floor of which 2 contained six beds each and 2 contained two beds each. Patients admitted to the 6-bedded rooms were not charged any fees.

This was the official description. Read what a reporter of the Singapore Free Press wrote:

"Mindful of the fact that one of the first duties of the State and of the community is the care of infants and the reduction of infant mortality, the Government has just completed and opened new Maternity Wards in connection with the General Hospital at Sepoy Lines.

The new Maternity Hospital is just across the road above the Nurses' Quarters of the General Hospital. The front looks over the grassy plain in front of the European Wards, and the back, right across the valley to the Mount Faber Ridge, as pretty a sight as any recovering mother would like to rest her eyes on, and far too extensive to be appreciated by her child. Considerable attention has been paid to the ground on which the hospital stands, so that the rainfall and sewage may be rapidly carried away. The building stands high and dry, and in a most airy situation. Built round the sides of a quadrangle, the rooms are nowhere more than one deep, with a good verandah on either side. The patients' rooms are on two sides, both stories. The kitchens, bathrooms and servants' quarters occupy another side, above being the linen room, stores, etc. There are properly fitted-up lying-in rooms for Europeans and Natives and the fittings of all the wards are designed to be at once medically efficient and as ornamental as may be. The floors are all of concrete, with washing gutters, the rooms are designed with rounded corners so as to be easily swept, and afford no gathering place for the enemy of surgical cleanliness, dust. Doors and windows all opening on to the verandahs, the rooms are almost open air themselves. And even when shut up at night, large ventilators near the floor, and a considerable portion of the ceiling with expanded metal openings give ample air access. The Public

Works Department seems also to have been at considerable pains to look after the minor details of the building, so as to make it not merely a good hospital, but also a comfortable dwelling. There are separate rooms for European patients and for the better classes, and wards for poorer patients, the only difference being in what may be called luxurious surroundings.

The wards furnish accommodation for 29 patients. An elaborate scale of fees has been drawn up to deal with all sorts and conditions of motherhood. The poorer classes of Europeans, Eurasians and Asiatics may be admitted free if enquiry proves that they are unable to pay anything, or they may be charged according to their monthly incomes, from \$3 to \$12 per case and from 15 to 75 cents per day extra after the prescribed fifteen days. Private patients are accepted, and every effort seems to have been made to meet the circumstances of all cases. The essential feature, of course, is that the mother shall go back into the world strong and healthy, and that the child shall have a fair start in life with health and vigour."

Two nurse probationers (Mrs Mathews and Mrs Pflug) passed their qualifying examinations during 1908 and were awarded diplomas to practise as midwives. By the end of 1908, fifteen women had been trained as midwives at the Maternity Hospital.

The Government continued training some student nurses in 1909 in the Maternity Block of the General Hospital. The admissions were increasing, especially among the Chinese, and it was hoped that as the Maternity Block became better known, the patients would provide sufficient "material" for the training of midwives. One nurse probationer, Mrs Cooper Abbs, qualified during the year, and Mrs Agnes Holman, another student nurse, joined the course.

INFANT WELFARE AND TRAINING OF LOCAL WOMEN AS MIDWIVES

During 1910, two very important decisions were made. A nurse to instruct non-European mothers in the proper care of their infants, with the hope of reducing the large infant mortality, was appointed in Singapore and placed under Municipal control. Secondly, a plan was formulated and approved for the training of local women, who were not nurse probationers, as midwives, the Government paying the cost of tuition and the Municipality the uniform and subsistence of the pupils. The scheme provided for the training of four pupils at a time. The first four pupils joined the course in May 1910 and underwent training in midwifery for six months. By the end of the year, two of them passed their examination, and one successful candidate went to work at the Cantonese Free Hospital (Kwong Wai Shiu Hospital), which had just established a maternity ward.

TRAINING OF MEDICAL STUDENTS

In 1910, the first batch of students at the Medical School graduated. This was an important event in the history of the Medical School. But there was one misgiving. The results of the Final Examination in Midwifery were poor. On investigation, the Principal of the Medical School found that the arrangements for teaching the practice of

midwifery were most unsatisfactory. Medical students had not been allowed to practise with even a moderate degree of freedom in the free wards of the Maternity Hospital (as the Maternity Block of the General Hospital was by then known), because it was feared that this would cause patients to refuse to come to the hospital. To offset this disadvantage, the Medical School Council decided that at the first available opportunity, an Outpatient Maternity Department (Domiciliary Midwifery) be instituted (as was the practice in the United Kingdom at that time) with headquarters in a suitable part of the town.

In 1911, in the hope of lowering the high infant mortality rate, Health Visitors were attached to the Municipal Health Department, to visit homes to advise mothers concerning the care of infants. With a similar hope, it was proposed to pass an Ordinance to license trained midwives, when a sufficient number had qualified, and to exclude from practice unlicensed and untrained midwives. Under the scheme for training local women as midwives started in 1910, four women obtained certificates of competency in 1911, and went to practise in the Municipality.

A number of European patients admitted to the Maternity Block of the General Hospital in 1911, came from Malacca and the Federated Malay States. Its fame had spread.

In 1912, electricity was supplied to the General Hospital, and the Maternity Block was allotted 26 lamps and 8 fans.

The high infant mortality rate was due to the ignorance and inexperience of the mothers, improper food, overcrowding in the poorer parts of the town with poor hygiene and sanitation. The Home Visitors were doing their best. The training of midwives to educate the mothers was not an easy matter considering the many races to be dealt with and their many prejudices. Moreover, although there was no lack of candidates for midwifery training, there were not enough patients to allow the training of more than four women at one time. It was hoped that the eventual establishment of an Outpatient Midwifery Department attached to the Medical School would help in the training of local midwives. The Municipal Commissioners also played their part in agreeing to pay the fees of licensed midwives and medical practitioners on a fixed scale in maternity cases when the patients were too poor to pay themselves.

In the Maternity Hospital, the number of Chinese patients admitted was more than double that of the previous year. 32 patients were attended by their own medical men.

In 1913, the Medical School opened its Outpatient Maternity Department (also known as the Extern Midwifery Department). Permission was granted by Government to make use of the old Maternity Hospital buildings in Victoria Street for this purpose. Mrs Ruth Amery was appointed Matron and Teacher. The experience gained by the medical students in personally visiting labour cases in their homes, and conducting the cases under the supervision of the Matron was invaluable. This more thorough training in practical midwifery would enable them in the future to supervise and help the midwives in the districts of their practice. In 1913, 155 maternity cases were attended to by the medical students. Two maternal deaths occurred, both due to assistance being called for too late. In one, the uterus had ruptured, and in the other, a case of impacted shoulder, the arm had been protruding five days, before help was sought. 50 abnormal cases, including 10 forceps cases, were

dealt with successfully. There was no doubt that this department was doing something towards the reduction of maternal and infant mortality. The lives of many mothers and infants had been saved. The higher standard of training given to the medical students would further reduce the mortality rates when they put their knowledge into practice after graduation.

But the upkeep of this department was beyond the means of the school funds, and the Medical School Council asked the Government to take over its maintenance from 1914.

Seven women qualified as midwives in 1913.

FREE MATERNITY HOSPITAL, VICTORIA STREET

The old Maternity Hospital, Victoria Street, was re-opened in September 1914 as a Free Maternity Hospital of 12 beds with a Matron in charge and a visiting staff (a panel of medical men could be called in to deal with abnormal cases). The Outpatient Maternity Department of the Medical School was absorbed into this new Free Maternity Hospital since it was already functioning there, and its Matron became the Matron of the Hospital.

Provision was made for the training of pupil midwives, and medical students were also in attendance when there was no objection on the part of the patients to males being around.

A special attempt was also made to encourage the admission of the poorer class of Malays and other Muslim women. A special room, kitchen and ayah were provided for them, and Muslim custom was followed compatible with antiseptic procedures and the patient's welfare.

The infant mortality continued to be high and was highest among the Malays. There were 15 midwives on the Municipal Register in Singapore at the beginning of 1914, 5 were licensed during the year and 2 died, leaving 18 at the end of the year.

The employment of trained midwives and nurses by the Municipality continued during the year. Every effort was made to train midwives in preparation for future legislation to regulate midwifery practice with a view to lowering the infant mortality rate. A draft bill for the registration of qualified midwives to the exclusion of those unqualified was drawn up in 1914.

FIRST MIDWIVES ORDINANCE

The most important event in the history of the maternity services in 1915 was the passage of the Midwives Ordinance. The Bill was read a first time in the Legislative Council on 14 May 1915 when the Colonial Secretary explained the object of the Bill which was to make it illegal for unqualified women to practise as midwives in any Municipality or Rural District within which the provisions of the Bill became law. The law would only be applied in those areas within which there was a sufficient number of trained women to deal with all maternity cases.

The only area then with a sufficient number of trained women was the Municipality of Singapore, and that happy state of affairs was due to the zeal and energy of the Municipal Health Officer, the support of the Municipal Commissioners and a Government grant during the past five years to assist in training local women as midwives.

To carry out the object of the Bill, provision was made in it for the training of midwives, for their examination and for granting certificates when they had successfully passed their examinations. Those who had

obtained certificates of proficiency would be eligible to be registered on the Register of Midwives and practise as midwives. Other women trained in any recognised training school; those who had been in practice one year before the Ordinance came into force and who were considered competent by the Health Officer, who was the Registrar, could also be registered. There were also provisions for names to be removed from the Register for malpractice and other offences.

It was the ultimate aim of the Bill to reduce the infant mortality rate.

During the debate when the Bill was read a second time on 28 May 1915, the problem of how to administer the law tactfully and not force it on the local inhabitants, especially the Malay community, was discussed. The main difficulty anticipated was how to deal with the Malay untrained midwives (bidans) already in practice and how to get other Malays to come forward to be trained. Of the 18 women already trained, only one was a Malay. The Principal Civil Medical Officer agreed that it would not do to be too strict at the very beginning. Although he did not like a law to be passed and then not enforced strictly from the beginning, he realised that he had to bow to a certain extent to the prejudices of the local population. It was necessary first to train more local women, especially the Malays, and to educate the local community on the benefits conferred by the law.

During the year, 8 pupils qualified after training at the Maternity Block, General Hospital. At the Free Maternity Hospital, Victoria Street, local women were also being trained. A Malay midwife was successfully trained for the Kedah Government and a Teochew Nyonya pupil passed and went to practise in the town. Great difficulty was experienced in training a "bidan" of long standing, especially in changing her bad and septic habits. However, with patience and perseverance on the part of the Matron, she showed great improvement.

Two Chinese ladies, Mrs Tan Jiak Kim and Mrs Lee Choon Guan, kindly undertook to defray all the expenses of two pupil midwives at the Free Maternity Hospital.

To paint a picture of the conditions before the Midwives Ordinance came into force, it would be interesting to quote some statistics. In 1915, the nature of attendance at confinements in the Municipality (other than by doctors) was as follows: out of 3,498 cases, 860 were attended by trained and 2,638 by untrained midwives, 965 by friends and 1,022 cases stated that they had been unattended in labour. These figures supplied the following percentages:

Attended by trained midwives	15.7%
Attended by untrained midwives	48.1%
Attended by friends	17.6%
Unattended	18.6%

It was hoped that the 48.1% attended by untrained midwives would be reduced when the Midwives Ordinance was brought into operation, but it was feared that an attempt on the part of these women would be made to evade the law, with the assistance of their patients, by posing as friends or relatives of the mothers (compare 1926, see below).

Malay midwives (most, if not all, untrained) were the most popular, followed by Chinese, Indian and Eurasian midwives (trained and untrained).

The Municipal nurses (Health Visitors) paid 5,963 visits during the year, and 1,401 re-visits where the condition of the mother or infant indicated the necessity for further attention. The total of visits and re-visits was 7,364. Although 84.3% of the cases seen by the nurses

had been attended by untrained midwives, friends and relatives or had not been attended by anyone, the condition of majority of the mothers and infants was classified as "good" or "fair" and the condition of the umbilical cord was found to be healthy in 91.1% of the cases. This indicated that the high infant mortality was not due only to unskilled attendance at birth but also to unsatisfactory ante-natal and post-natal conditions, such as poverty, overcrowding, bad housing, insanitary surroundings, lack of intelligence on the part of the mother, working mothers and improper feeding of infants. The necessity for including instruction in the care of infants as well as in midwifery had been recognised (as could be seen in the syllabus of training of midwives). Other changes in the social environment were beyond the powers of the medical authorities.

In the beginning of the year, Government being convinced that the poor were being neglected for the rich by the midwives, refused to introduce the Midwives Bill unless the Municipal Commissioners made provision for Salaried Midwives who would attend poor cases only. The Midwives Bill was later passed and rules made under it were approved by the Municipal Commissioners and forwarded to Government. The Ordinance, however, was not brought into operation in 1915.

At the end of the year, there were 29 licensed midwives - 1 European, 2 Eurasians, 23 Chinese, 1 Malay, 1 Indian and 1 Japanese.

The Midwives Ordinance was amended in 1916. Some of the amendments had been suggested by the Central Midwives Board of the United Kingdom to whom the principal Ordinance had been submitted by the Secretary of State for the Colonies for its consideration and criticism. Others had been thought of locally to improve the principal Ordinance. Two important amendments were (a) the creation of two qualifications for midwives instead of one as in the principal Ordinance, which provided for a person who passed the examination to be awarded a "certificate". The amendment provided for the award of a "diploma" to a person who had undergone a longer period of training and had passed a more difficult examination than a person who had obtained a "certificate"; (b) power was given to any woman on the register of midwives of any district to practise in any other district, on applying to have her name entered in the registers of midwives of the districts in which she wished to practise. The Midwives (Amendment) Bill 1916 was passed on 3rd November 1916.

In 1917, eight pupils at the Maternity Block, General Hospital, passed their midwifery examinations.

The Midwives Ordinance (as amended) came into force in the Municipality of Singapore on 1 July 1917. In order to assist the Health Officer in the work entailed, the services of Dr Violet Burne were obtained. There was no difficulty in registering qualified midwives, but the unqualified ones who were in practice when the Ordinance came into force, presented a considerable amount of difficulty. In the first place, they had to be discovered as only a few were known to the authorities. Most of them were Malays. It was considered inadvisable to put these untrained midwives on the register without finding out something about their work. An arrangement was made with them to report their cases at the Health Office at the earliest opportunity. Their cases were then visited by Dr Burne and/or the Health Visitors and some idea was obtained as to how they worked.

During 1918, ten pupil midwives were selected for a course of six months' training at the Maternity Block,

General Hospital. Of these, six succeeded in obtaining certificates.

At the Maternity Block, General Hospital, in 1919, about one third of the confinements were "abnormal" (121 out of 359). This was explained by the fact that midwives had been trained at the hospital for years and as the number of qualified midwives in private practice increased so the number of normal cases admitted to hospital fell. 12 maternal deaths occurred, mainly among the Chinese patients. Many of these cases had been admitted in a very grave condition, the result of excessive handling by ignorant friends and delay in seeking aid at the hospital.

Seven out of 9 pupil midwives passed their examination.

GMC WARNING AND THE RESULTING CHANGES

1919 was an important landmark in the history of the Medical School and the maternity services of Singapore. The Medical School produced its first graduates in 1910, and in 1916, its diploma of Licentiate in Medicine and Surgery (L.M.S.) was recognised by the General Medical Council. But in July 1919, the General Council of Medical Education and Registration of the United Kingdom (to give the G.M.C. its full name) sent a warning to the Government that if the standards of teaching and examination were not fully maintained, the Council would have to reconsider the recognition of the Licence of the Medical School. Falling standards were mainly due to the fact that very few members of the teaching staff were full-time and permanent, the rest were part-time teachers who were in private practice or in the Army and they were changed often to the great detriment of the students. Other teachers were junior medical officers in the Government service. There was hardly any organised teaching.

This bombshell from the GMC was a blessing in disguise. It resulted in the Medical School having a new building in College Road, the raising of the standards of teaching (the benefits of which can be seen in present-day Singapore and Malaysia), and the conversion of Kangang Kerbau Hospital into a Maternity Hospital.

On receipt of the stern warning from the GMC, the Governor instructed the Principal Civil Medical Officer, Straits Settlements, the Principal Civil Medical Officer, Federated Malay States, and the Principal of the Medical School to consider the problem carefully and to come up with concrete proposals for improving the status of the school and the efficiency of its teaching.

They identified the problem as due to the following factors:

- (a) shortage of staff;
- (b) shortage of space (for lecture rooms, laboratories, library, hostel accommodation for senior students near the teaching hospital, Tan Tock Seng Hospital);
- (c) lack of facilities and equipment for practical work;
- (d) lack of specialised teaching.

And they made the following recommendations. To overcome the shortage of staff and lack of specialised teaching, they recommended the creation of a number of full-time Chairs, the Professors to be paid on a scale that would attract and keep good men, and assure them the prestige properly enjoyed by staff of a Medical School. One of the Chairs to be created was that of Professor of Midwifery and Gynaecology.

To overcome the shortage of space, the remedy was

to provide new buildings, A new Medical School building was suggested to remedy the deficiencies. A hostel at Tan Tock Seng Hospital was badly needed to supplement the insufficient hostel accommodation and to enable the senior students to be on the spot for their clinical training.

Lack of facilities and equipment for practical work would be overcome by the provision of extra staff, extra buildings and adequate funds.

The proposals were put before the Legislative Council and were unanimously approved, the increased expenditure to be borne by the Straits Settlements and the Federated Malay States in equal shares. They were keen to avert the disaster of the L.M.S. (Licentiate in Medicine and Surgery) not being recognised by the GMC and the far-reaching consequences on the country. The Director of Medical and Sanitary Services said,

".... The filling of the appointments in connection with the School to which the Secretary of State has agreed should be of the greatest help to us in maintaining and improving it as a teaching body. I believe that with careful guidance and encouragement there should be a great future for the King Edward VII Medical School, and that in course of time it may become one of the most important, if not the most important, Medical Institution in the Far East.

No arrangements have yet been possible for the institution of post-graduate study at the Medical School and hospitals of Singapore. I am very anxious that this should be done since the facilities for locally qualified medical men to refresh and increase their professional knowledge in later years are very limited."

From the Final Year results, it was evident that Midwifery was the weakest subject. The students were taught by part-time Lecturers (who were changed whenever one went on leave) and the staff of the Maternity Hospitals. To improve matters, Dr Loh Poon Lip was appointed Temporary Tutor in Midwifery. However, this post was abolished as unnecessary, when Dr O J Murphy, a Medical Officer in the Government Service, was appointed Lecturer in Midwifery and Officer in charge of Maternity Hospitals on 1 June 1921. Dr Murphy himself lost his job when the Secretary of State in London selected Dr J S English, MD, B Ch, BAO, as Professor of Midwifery and Gynaecology, whose duties were :

1. To be in general charge of the Department of Instruction in Midwifery and Gynaecology at the Medical School.
2. To give a complete course of systematic lectures upon these subjects.
3. To supervise the practical work of the Medical Students at the Sepoy Lines and Free Maternity Hospitals
4. To be on call as consultant at these Hospitals.

During 1921, the accommodation for patients at the Free Maternity Hospital, Victoria Street, was increased by 3 beds. The Nursing staff was increased by one staff nurse and one probationer. Prior to this, the Matron worked single-handed.

Dr J S English assumed duty as Professor of Midwifery and Gynaecology on 26 February 1922, and in time, re-organised the system for practical work in Midwifery.

1923 MIDWIVES ORDINANCE

An unfortunate incident occurred in September 1922

which led to the passing of the 1923 Midwives Ordinance. A patient of a midwife died, and under the existing laws an enquiry was held by the Municipal Commissioners, and a report was eventually made. The report recommended a number of amendments to the Midwives Ordinance, particularly one that inquiries should be held, not by the Municipal Commissioners, but by some body of persons who were specially qualified to deal with such matters. After studying the British, Scottish and Irish Midwives Acts, a new Bill was drafted which recast parts of the previous Ordinance with a few new additions. It established the Central Midwives Board, set out the duties and powers of the Board especially the training of midwives, the conduct of examinations, the issue of certificates and diplomas, admission to the Roll of Midwives, the power to caution, censure, suspend or remove from the Roll the name of any midwife. It also gave any midwife who was removed from the Roll the right to appeal to the Supreme Court. There was a section which dealt with emergencies, and the calling in of a medical practitioner by a midwife in case of emergency.

The Midwives Ordinance was passed on 25 June 1923.

Other changes affecting the maternity services were also in the offing. A new Operation Theatre for the Maternity Block, General Hospital, was completed in 1923. At the Free Maternity Hospital, Victoria Street, the accommodation was taxed to its utmost capacity, many patients having to be sent away from time to time. Not only were patients denied hospital care, medical students and pupil midwives were denied opportunities and "material" for teaching purposes, thus delaying the Government's policy of trying to reduce the maternal mortality and infant mortality rates.

KANDANG KERBAU MATERNITY HOSPITAL

A proposal to convert the Kandang Kerbau Hospital into a Free Maternity Hospital was approved. In July 1923, structural alterations to the building began, one ward being put out of use then. On 15 December the remaining patients were transferred to the General Hospital, and the Kandang Kerbau Hospital was closed for renovations, which, with the erection of new buildings to form the Maternity Hospital, continued into 1924 and 1925.

The new Free Maternity Hospital at Kandang Kerbau was opened on 1 October 1924, and the old hospital at Victoria Street was closed on the same day. The accommodation doubled, from 19 beds at Victoria Street to 30 beds at Kandang Kerbau. The poorer people would not be denied the facilities of the new hospital for lack of accommodation.

THE EARLY YEARS (II)

Before continuing with the history of Kandang Kerbau Hospital in its new role as a Maternity Hospital, I will trace the part it played in the Medical Services of Singapore from 1888 to 1923 (see above).

In 1888, the Lock Hospital became a voluntary institution and admissions fell. Two wards were used as a Home under the Women's and Girls' Protection Ordinance, for women and girls brought from China for prostitution and "rescued" by the Protector of Chinese. During the year, the Female Ward at Tan Tock Seng Hospital was under re-construction and the pauper women patients were admitted to one of the wards of the Lock Hospital. Only two wards were used for the

treatment of venereal diseases in prostitutes, thus leaving five wards empty out of the total of ten.

In August 1889, the pauper women patients were transferred back to Tan Tock Seng Hospital.

Two wards were more than sufficient for all the requirements of the Lock Hospital. In 1891, a part of the front block of buildings, which had been unoccupied since the abolition of the Contagious Diseases Ordinance, was converted into quarters for the Dresser doing duty at the Government Dispensary, the other portion being temporarily used by the Census Office.

It was very uneconomical to run the Lock Hospital, and in January 1895, the Governor reported to the Secretary of State that the Principal Civil Medical Officer had proposed that the Lock Hospital be closed and the patients transferred to Tan Tock Seng Hospital. The Secretary of State replied that he would only approve of the move if provision was made to treat the patients in a separate ward in Tan Tock Seng Hospital and not mixed with "decent" women.

By 1899, more women were going voluntarily to the Lock Hospital for treatment.

Thereafter, the Lock Hospital continued to be used as a hospital for the treatment of prostitutes with VD and other diseases, and also served as a "reserve" hospital whenever accommodation was required for female pauper patients of other hospitals. In early 1905, female pauper patients were transferred permanently from Tan Tock Seng Hospital.

Over the years, the hospital beside the Canal in the Kandang Kerbau district underwent a number of metamorphoses. It started as a General Hospital in 1860, then became a Lock Hospital where prostitutes were compulsorily treated for venereal diseases, then as a Lock Hospital where prostitutes came voluntarily for treatment of venereal diseases and other ailments, then part of it was used as a poor house and hospital for pauper women, and later another portion was used to house female lepers, and finally poor children were also admitted for treatment. The Outpatient Department underwent similar changes. From catering for prostitutes, it later looked after Government servants and their families, and finally poor women and children and indigent males.

Thus by 1923 when it was decided to convert Kandang Kerbau Hospital into a Free Maternity Hospital, it was essentially a Pauper Hospital for Women and Children.

In 1925, the first complete year, when the Free Maternity Hospital functioned at Kandang Kerbau, 714 patients were admitted into hospital and 588 delivered. 48 gynaecological operations were performed. A Children's Ward of 12 cots was maintained at the hospital. The Government Women's and Children's Outdoor Dispensary in the charge of a Lady Medical Officer continued to be at Kandang Kerbau Hospital.

On September 3rd 1926, the female lepers were moved from their overcrowded quarters at Kandang Kerbau to a spacious camp at Trafalgar.

In 1926, of the 8,966 mothers visited by the Health Visitors, 7,789 were living in cubicles or single rooms. At the confinement of these mothers (compare 1915, see above):

49 were attended by medical men
28 were attended by A Class midwives
6110 were attended by B Class midwives
1376 were attended by C Class midwives

1028 were attended by friends

375 were unattended

An explanation of the distinction between Class A, B and C midwives would not be out of place. This is shown in the Rules made under the 1923 Midwives Ordinance:

Class A was composed of persons holding the certificate of the C.M.B. of England, Scotland or Ireland, or any certificate which the Central Midwives Board of the Straits Settlements might deem to be of similar standard, and of persons holding the Diploma under the Midwives Ordinance. No person was admitted to the examination for the Diploma until she had undergone 12 months training in Midwifery at one of the local Maternity Hospitals. The examination was of the same standard as that of the C.M.B. of England, Scotland and Ireland. The candidates comprised Europeans, Eurasians and a few educated Asiatics, most of whom were Chinese. Almost all the local nurse probationers took the course as their fourth year of training.

Class B was composed of persons who had undergone a training varying from 6 to 9 months at one of the Maternity Hospitals and who had not sufficient education to pass a written examination in English. The examination was oral and practical and a Certificate was awarded to successful candidates.

Class C was composed of persons who were in bona fide practice as Midwives for 12 months before the date when the Midwives Ordinance came into force.

In 1926, 870 patients were admitted into the Free Maternity Hospital and 788 delivered. 29 gynaecological operations were performed.

In 1927, 1,193 patients were admitted and 1,019 delivered. There were 114 gynaecological operations. The workload of the hospital gradually increased. Building of a new Sisters' Quarters at Kandang Kerbau Hospital was also carried out in 1927. Although work on the Hospital had been completed some time previously, the Sisters' Quarters could not be built because the site was occupied by the old Female Leper Ward which had since been pulled down.

By 1929, the Professor of Midwifery could report that the teaching of practical midwifery was no longer a problem. During the year 1929, there were 2501 deliveries in the Maternity Hospitals of which 2200 (1606 in KK Hospital) were available for teaching purposes. Deducting 10 percent as abnormal cases, this left 2000 which could be personally delivered by medical students or pupil midwives. During the year, 25 midwives were trained (each delivered 20 patients) leaving 1500 cases for the medical students. There being so many cases, medical students had no difficulty in complying with the GMC Regulations and were encouraged to deliver as many more as they could. They were also permitted under supervision to apply forceps and a large majority had delivered at least one breech presentation during their course. The medical students also dealt with ante-natal and post-natal cases. While the teaching of practical midwifery was simple, that in practical gynaecology was proportionately difficult, as the patients refused to be examined by the medical students.

Although the majority of midwives were trained in the Government Hospitals, a few were trained in the St Andrew's Mission Hospital.

In September 1930, the Colonial Secretary reported that consequent on the steady increase in the number of Asiatic midwives trained in the Maternity Hospitals, it was possible to bring into force the provisions of the Midwives Ordinance in the rural areas of Singapore (and Penang and Province Wellesley). It was expected that the improvement in midwifery practice and the spread of maternal and infant welfare clinics would lead to a further decrease in maternal and infant mortality. Maternal and Child Welfare Services were provided by the Municipality of Singapore within its boundaries, by the Singapore Child Welfare Society, and by the Government in the rural areas.

There were proposals to extend Kandang Kerbau Hospital, including a Dispensary and quarters for two doctors.

By the end of 1931, the building of the Third Class Block at Kandang Kerbau Hospital had progressed considerably. The new lying-in wards were opened at the end of September 1933 resulting in increased accommodation for patients. A flat on the top of this block was for the Assistant Medical Officer (as local government doctors were then known), and another served as quarters (opened in 1934) for six medical students, as two months' residence was by then compulsory to conform with the recommendations of the General Medical Council. Medical Students were posted to Kandang Kerbau Hospital for three months at a time.

In March 1933, the Governor recommended that fees for Specialists be revised. The Accoucher in midwifery cases was to get one-quarter of the fees charged by Government. (These rules were approved by the Secretary of State in December 1934.)

Work in Kandang Kerbau Hospital increased rapidly. In 1932, there were 2,383 admissions and 2,336 deliveries. In 1933, 2,417 admissions and 2,303 deliveries and 27 maternal deaths. In 1934, there were 2,826 admissions and 2,579 deliveries and 37 maternal deaths. And the Director of Medical Services reported,

"....The maternity services rendered by the Kandang Kerbau Hospital, where all beds are free, have proved increasingly popular in recent years and have necessitated the erection of a large modern block of wards containing 85 beds. It is believed that this hospital which recorded 2,579 deliveries is now one of the largest maternity hospitals in the Empire."

In March 1934, there was a proposal from the Director of Medical and Health Services that the Government should grant certain selected medical officers adequate full-pay study leave for the purpose of taking a special postgraduate course in obstetrics. Such officers would be posted to Government Maternity Hospitals or special maternity wards of Government Hospitals. They would be styled "Specialist in Midwifery" while occupying such posts and would be eligible to draw fees as laid down for specialist officers i.e. one quarter of the fees charged by Government. An officer on ceasing to perform maternity work would automatically cease to be styled "Specialist in Midwifery". The following reasons were adduced in support of this recommendation:

1. Confinement cases took up many hours outside an officer's normal working hours, often during the night.
2. A degree of skill above the average was required to forestall accidents and deal with emergencies during child-birth.

3. Midwifery was an unpopular branch of medicine; opportunity to obtain special study leave, to be styled "Specialist" and to retain fees, would act as an incentive to medical officers to practise and keep themselves proficient in Midwifery.

At that time, the Professor of Midwifery, College of Medicine, Singapore, was the only specialist in Midwifery.

This recommendation was approved by the Secretary of State after it was forwarded to him by the Governor.

The Professor of Midwifery reported in 1934 that "... the practice of admitting postgraduate students to work in the hospital has been continued and this year five were seconded there for varying periods up to three months. This is considered an excellent practice, which must make for an increase in efficiency in those hospitals to which the students may afterwards proceed, and certainly provides useful assistance for the permanent staff of the hospitals to which they are attached for this training."

In the same year, the Colonial Secretary stated in the Legislative Council:

"....Additional wards in the New Building were opened this year, and at present 74 lying-in beds are in use. With an increase of staff, it will be possible to open two other wards making a total of 114 lying-in beds available.

During this year, an Ante-natal and Post-natal Clinic attached to this Hospital was opened and a Special Ward for the treatment of ante-natal cases that require institutional treatment is now available.

.... This Clinic supplies ante-natal advice to wives of Government servants and to the poor and acts as a Consultation Centre for cases sent from the Rural Area by the Government Health Sisters from the five Child Health Centres.

The Hospital acts as a Midwifery Training Centre for Medical Students, Postgraduates, Nurses and Midwives who come from Singapore and various parts of the Peninsula."

Kandang Kerbau Hospital had come a long way in the ten years since it became a Maternity Hospital on 1 October 1924.

In 1936, it was decided to enlarge the Kandang Kerbau Maternity Hospital by the construction of another new block of buildings to provide adequate accommodation for maternity cases for many years to come.

There were 3,507 deliveries in 1935 and 4,717 deliveries in 1936. Kandang Kerbau Maternity Hospital had 130 beds in 1936. The average number of patients delivered by a medical student was 69.9 and the number of confinements witnessed was 97.1. This was a great deal in excess of the requirements of the G.M.C. But the Professor of Midwifery said that he "would hesitate to suggest a curtailment of the period spent as the work is so essential. While in residence the students also take an active part in the daily ante-natal and post-natal examinations."

In 1937, the number of deliveries increased to 5,214. This was partly due to the decision to admit all Third Class (free) patients to Kandang Kerbau Hospital, reserving the Maternity Block of the General Hospital for First and Second Class patients (the General Hospital used to admit a few Third Class patients). The maternal mortality was still regrettably high at the Kandang Kerbau Hospital which had 93 deaths for 5,214 deliveries. It

must, however, be remembered that almost every complicated and abnormal case was taken to this hospital, often when labour was far advanced, and after the patient had suffered from unskilled treatment and interference.

Plans for the extension of Kandang Kerbau Hospital were passed in 1937 with construction of the new block to start in 1938. The block would contain Ante-natal and Post-natal Clinics and up-to-date labour wards and increase the number of beds. There was also a proposal to concentrate all maternity work at the Kandang Kerbau Hospital.

In 1938, of the 11,206 babies born in Singapore, 5,551 were delivered at the Kandang Kerbau Hospital, and the maternal deaths were still unacceptable - 94. However, the difference in the morality rate between the patients who had attended the antenatal clinics and those who presented themselves for the first time in labour was very striking, and showed the great importance of antenatal work in the reduction of maternal morbidity and mortality. At Kandang Kerbau Hospital, only 692 of the cases admitted had attended the antenatal clinic. Amongst these 692 cases there was only one death, a case of eclampsia. Amongst the "unbooked" cases, there were 93 deaths in 5,296 cases. 37 of these deaths were, however, due to pre-existing diseases complicated by parturition eg. acute beri-beri.

The new block was completed by the end of 1939 and early 1940. War had broken out in Europe, and by 1941 there were threats of war in the Far East. The Government by then was concentrating of the war effort and preparation for war.

Plans had been made for converting the General Hospital, Tan Tock Seng Hospital and Kandang Kerbau Hospital for the reception of war casualties in the event of war. During the war with Japan, the hospitals were severely taxed with air-raid casualties and wounded from the fighting forces. In the last week before Singapore fell, Japanese shells landed in the hospitals causing casualties. In Kandang Kerbau Hospital, two doctors and a midwife were killed by a shell.

THE JAPANESE OCCUPATION

During the Japanese Occupation of Singapore, Kandang Kerbau Hospital was used as a General Hospital (including Obstetrics and Gynaecology) for Japanese civilians and the local inhabitants. It was known as Chuo Byoin (Central Hospital). As far as I can recall, the following were the senior staff (Japanese and locals):

Medical Superintendent	Dr Tanaka
Deputy Medical Superintendent	Dr B H Sheares
Hospital Secretary	Mr Oshio
Chief Clerk	Mr Kwek Swee Lim
Physicians	Dr Nakamura Dr G Haridas Dr B R Sreenivasan (who was also the Radiologist. He did only screening as there were no X-ray films.)
Surgeons	Dr Watanabe Dr K Vellasamy Dr Au Kee Hock
Obstetricians & Gynaecologists	(no Japanese)

Venerologist	Dr B H Sheares
Pathologist	Dr A C Sinha
Dental Surgeons	Dr Uemura Dr T Balasingham Dr Ito Dr Tay Teck Eng Dr Lim Choon Guan
Medical Officers	Dr C J Oliveira Dr E C Winslow Dr Goh Kok Chuan Dr Ong Kim Tin Dr Khong Ban Tze Dr Tan Lee Koh Dr Lee Siew Choh Dr Tan Jiak Hoon Dr Mary Tan Dr Khoo Kim Cheng
Pharmacist	Mr Lim Teng Kok
Matron	Miss Kasuga A Taiwanese (Assistant) Miss Dora Dossen (Assistant) Mrs Hashimoto
Interpreter	Mr K Shanmugaratnam (Pathology)
Medical and Dental Students working in the hospital	Mr Chen Chi Nan (Radiology) Mr J A Jansen (Dental Clinic)

POST-WAR DEVELOPMENTS (INCLUDING POSTGRADUATE TRAINING)

After the war was over, Kandang Kerbau Hospital remained a Civil General Hospital until June 1946, when all Medical, Surgical and Paediatric cases were transferred to the General Hospital, Sepoy Lines, and from 1 July 1946, Kandang Kerbau Hospital commenced to function as the only obstetrics and gynaecological hospital serving all classes of the Singapore community. With the closing down of St Andrew's Mission Hospital, the non-opening of the Sepoy Lines Maternity Hospital and the incorporation of the Gynaecological Service, the work of the hospital increased very considerably. Work in all departments increased two to three times that in 1941.

Teaching re-commenced on 5 June 1946. In addition to the regular courses for the training of nurses, midwives and medical students, 23 medical students and 75 midwives who qualified during the Japanese regime were given refresher courses.

Rehabilitation of Singapore began soon after the war was over. The Medical Department reviewed the medical needs of the community. It was decided that an adequate hospital service on European lines be evolved, taking into consideration the increased and increasing population and the necessity to serve both the poor and those who could afford to pay. Where Kandang Kerbau Hospital was concerned, the plan was to modernise and expand to 500 beds with adequate staff of all grades and ranks. 1947 was the planning year and it was envisaged that the Medical Plan for Singapore would come to fruition gradually over five years (1948 - 1952). The expansion and modernisation of Kandang Kerbau Hospital was to

have been completed in two years (1948 - 1949), but it was not to be (see below).

The five years from 1947 to 1951, when Kangas Kerbau Hospital had about 240 beds (200 for maternity cases), saw an increase in the numbers of patients, both inpatients and outpatients, attending the hospital. There was also a decrease in mortality among the midwifery and gynaecological patients and an increase in the number of abnormal labours indicating that the Maternal and Infant Welfare Clinics were functioning better and referring the cases to the hospital.

This disappearance of fear of hospitalisation among the local people and the increased desire for ante-natal and post-natal supervision were the most striking changes when compared to pre-war times. The average stay in hospital was 4 days instead of the 10-12 days which was then considered desirable.

The decrease in maternal mortality was heartening, but the aim of the hospital was succinctly stated by the Professor of Midwifery, Professor English:

"There can be no reduction of effort until all pregnant women are seen ante-natally and until mortality only occurs amongst those who die from some accidental or intercurrent disease or those who should not have become pregnant."

(see end of article for some statistics which show that his wish came true.)

In 1949, a small block was set aside for paying patients who could be looked after by hospital doctors or by their own doctors. This was necessary because in Singapore then, there were very few maternity homes with a negligible number of beds.

In 1950, for the first time, births averaged over 1000 a month (13,238 for the year), and the labour wards were so overcrowded that it sometimes became necessary to deliver patients on trolleys. To ease the overcrowding, the length of stay of each patient in uncomplicated cases was curtailed to three days.

Admissions of more mothers who were "abnormal cases" led to an increase in the number of premature babies who needed specialised care, but in 1951 not much could be done as shown in this statement: "although it is quite impossible under the existing conditions in this hospital to create a special nursery for these infants, they do receive a good deal of added care and attention."

Dr B H Sheares who had been acting Head of the University Department of Midwifery and Gynaecology since 1946, was appointed to the Chair in January 1951.

The hospital was in 1951 re-organised on a two-unit system to improve its efficiency. One Unit was under Professor B H Sheares and the other under Dr A C Sinha, the Government Specialist.

The Medical Plan was still in its planning stage. By the end of 1951, plans had been completed to extend the hospital into a 350-bedded one with the necessary outpatient clinics and ancillary departments on the most up-to-date lines. Another 240 beds would be provided later on another site.

In 1952, the number of births averaged 1,200 a month (15,321 for the year), and the number of premature babies also increased. Facilities for the care of premature babies and cases of puerperal sepsis were most unsatisfactory. In the former, the lack of a Paediatrician was felt both from the clinical and teaching aspects. An improvement during the year was the installation of an X-ray unit where pelvimetry in cases of difficult labour might be done. Work on this new diagnostic X-ray Department started

towards the end of the year to supply a long-felt need. So far, all radiology had been concentrated at the General Hospital.

The Hospital was not recognised by the Royal College of Obstetricians and Gynaecologists as a training centre for the Membership examination owing to lack of residential accommodation for the trainees and other deficiencies.

A revised Midwives Ordinance introducing a new scheme of training based on that in the United Kingdom had been drafted by the Central Midwives Board in 1950. It was not passed until 1954 because of the difficulty of fitting the Malay "midwife" in the rural areas into the scheme. The scheme included the establishment of a domiciliary midwifery unit. In the meantime, local staff were sent overseas for training as midwifery tutors, and the World Health Organisation provided an experienced midwifery tutor and adviser.

A new Ordinance for the registration of Nursing Homes and Maternity Homes was also drafted. It was passed in 1959.

1952 also saw the start of another new ancillary department - the Almoner's Department. This indispensable department dealt with the social problems of patients, the adoption of babies, etc.

On 6 October 1953, the foundation stone for the new extension of Kangas Kerbau Hospital was laid by His Excellency the Governor, Sir John Nicoll, KCMG. The extension which covered an area of 13 acres was to include:

- (a) a most up-to-date outpatients division with ante-natal, post-natal, gynaecological clinics and a general Women's and Children's Clinic.
- (b) a new Ward Block of 116 beds (12 in a septic unit; 24 in labour wards and 80 in general lying-in wards). In addition, there were two operation suites, an X-ray department and a dispensary.
- (c) a laboratory block, a library and a museum.
- (d) a hostel for nurses and midwives.
- (e) a hostel for housemen and medical students, a lecture theatre seating 100 persons and a separate professorial suite.
- (f) quarters for Matrons, Sisters, Medical Officers and Hospital Assistants.
- (g) attendants' quarters.

On completion of this extension, the two existing wings would be thoroughly modernised bringing the hospital on the present site to 350 beds. The second phase provided for another 240 beds on another site.

It was hoped that the new extensions would be ready by October 1954 to help deal with the increasing attendances in the outpatient clinics and admissions into hospital. Further, the provision of "resident" quarters for housemen and medical officers within the institution, would solve one problem in postgraduate specialisation.

In October 1953, the demand for maternity beds became so great that in spite of reducing the length of stay of each normal patient in the hospital from three to two days, it could only be met by providing 20 more beds and placing them along the corridors. There were 1,695 deliveries during the month (total for the year was 17,958).

On the question of a domiciliary midwifery service to overcome the acute shortage of beds, the authorities were not very much in favour for the following reasons. In the Rural Area with some one third of the population, there was already an excellent Government domiciliary

service from which only abnormal cases were sent to Kandang Kerbau Hospital. In the City, domiciliary midwifery was impossible for the majority of the inhabitants were housed in cubicles and tenements which had no privacy. Hence the existing policy of admitting any woman who wanted admission in the belief that some service was better than none; with early discharge in "normal" cases and follow-up by home visiting and attention by the Municipal Health Visitors. To supplement this, a Domiciliary Aftercare Service run by the hospital was being considered.

While the hospital had no facilities to give special attention to premature babies and babies requiring intensive care, action had been taken to convert certain rooms attached to wards into nurseries for specialised care. The new block would have such nurseries.

In 1954, moves were initiated with the Royal College of Obstetricians and Gynaecologists for recognition of the hospital as a training centre for the Membership examination. The trouble then was that there were no residential quarters for the trainees.

Early discharge from hospital, two or three days after confinement, provided everything was normal with the mother and child, could not solve the problem of acute shortage of beds. Therefore, on 1 May 1954, a Domiciliary Aftercare Service was introduced to look after normal cases from the City area who were discharged 24 hours after confinement. The patients were carefully selected and if their homes were found suitable, they were sent back by ambulance, and midwives, under the charge of a Sister, visited such patients during the puerperium, and reported any abnormality, and appropriate action would be taken by the hospital authorities. 20 to 30 patients were discharged and handed over to this Service each day, and this considerably eased the bed situation for the time being.

The long-hoped-for extension to the hospital was not ready in October 1954 as planned. The new extensions were declared opened by Lady Black, the wife of the new Governor, on 10 August 1955. The bed-strength of the hospital was now 316 (50 gynaecological and 266 maternity). In spite of this increase in the bed strength from 240 to 316, the hospital was still short of accommodation to meet the ever-increasing demands for admission. 2,180 babies were born in October 1955, an all-time record.

In another move to combat the demand, a Domiciliary Delivery Service was started in August 1955. Normal cases who had received ante-natal care in the hospital, were interviewed and the Service explained to them. They were at liberty to choose home delivery or hospital delivery. Homes of those who chose domiciliary delivery were visited to assess their suitability for deliveries to take place there. Considerable difficulties were experienced on religious grounds, superstition and lack of privacy, but in spite of all this, bookings were made, and the first baby was delivered under this Service in September 1955.

Up till July 1955, the hospital had been without the services of a Paediatrician. This serious omission was rectified by the attachment of a part-time paediatrician who was under the supervision of the Paediatric Specialist at the General Hospital. The filling of this post also fulfilled one of the stipulations laid down by the Royal College of Obstetricians and Gynaecologists before recognition of the hospital as a training centre could be granted.

The long overdue services of a Physiotherapist were

met by the appointment of a part-time physiotherapist in November 1955 acknowledging the importance of her presence in any maternity and gynaecological hospital. A part-time Occupational Therapist from the General Hospital also started to visit the wards once a week.

The hostel for medical students was only completed in December 1955. It was also used by medical officers training to be specialists in Obstetrics and Gynaecology. "Residence" was one condition to be fulfilled before a candidate could sit for the examination for the Membership of the Royal College of Obstetricians and Gynaecologists. Medical Officers' quarters were not ready for occupation then.

The Domiciliary Delivery Service in 1956 became a Teaching Unit for medical students, nurses and pupil midwives. The training given to the students comprised ante-natal care of patients in their homes, attendance at delivery and follow-up during the lying-in period. In all cases, the students were accompanied by very experienced midwives.

At the beginning of 1956, a nursery on the second floor of the new building was converted into one for premature babies, a long felt need.

In December 1956, two representatives of the Royal College of Obstetricians and Gynaecologists inspected the hospital to report on its suitability as a post-graduate training centre. Recognition was declined, worded thus "... Our Visitors' reports have shown us that the local needs and problems of the Kandang Kerbau Hospital are not compatible with the requirements for training candidates for College examinations."

The Heads of Units had to continue to make use of their personal contacts with senior consultants in the United Kingdom to secure training posts in British hospitals for the local trainees.

During the second half of 1958, incubators were used for the first time in the premature baby nurseries. This led to a reduction in mortality.

The hospital authorities in 1959 came to the conclusion that as long as the Domiciliary Aftercare Service existed, it was one reason why patients would continue to refuse home confinements.

The Midwives Ordinance was amended again this year, but only minor changes were made.

The number of deliveries in the hospital showed a progressive rise from 24,940 in 1956 to 39,436 in 1963. This was due in part to the natural increase in the population as well as the increase in the proportion of births taking place in the hospital, from 41% to 66% of the total births in Singapore.

In 1961, the bed capacity was brought up to 438 beds by the staffing of a vacant ward. In November, the University Unit which had shared half the work of the hospital contracted down and its "service" responsibilities were reduced. The unit was allocated 54 beds for maternity cases and 27 beds for gynaecological cases. The University Unit would concentrate on the teaching of undergraduates, postgraduate training of doctors and research. The single Government Unit was divided into two sub-units utilising the remaining hospital beds, almost double the previous work-load, while continuing to teach medical students in its wards.

The Head of the University Unit, Professor B H Sheares, resigned on health grounds after 31 years' service in the hospital. Dr Tow Siang Hwa was appointed acting Head in his place. Dr Chong Tuck Kwong and Dr

Lean Tye Hin headed each of the Government units, with Dr Chong in overall charge.

The highlight of 1962 was the re-organisation of the hospital and the opening of all the wards, the two theatres for gynaecological patients, the two theatres for obstetric cases and the two minor operating theatres.

The bed-strength of the hospital was 443. 314 beds were allocated for obstetrics cases and 129 for gynaecological cases. There were 90 cots in the nurseries, of which 42 were in the Premature Babies Unit.

The hospital was re-organised into two main sections:

- (a) the Training Units; and
- (b) the Maternity Home Unit and the Paying Ward.

There were three Training Units. The University Unit remained as it was with 54 beds for obstetric cases and 27 beds for gynaecological cases. The Unit would concentrate on undergraduate teaching and postgraduate training. To do this efficiently, the Unit had to be relieved of the heavy load of routine hospital work.

Part of the Government section was organised into two Training Units, A and B, under Mr T H Lean and Dr S M Goon (later, Dr Y Salmon) respectively. Each of these units was structured on the same lines as the University Training Unit, also with a view to securing recognition of posts for the training of medical officers for the examination for the Membership of the Royal College of Obstetricians and Gynaecologists. Each unit had 47 beds for obstetric cases and 44 beds for gynaecological cases.

Not included in these Training Units, were 126 beds for maternity cases which formed another Government unit, where the great bulk of the normal deliveries in the hospital was undertaken. About 65% of the total deliveries in the hospital used these beds, and the major part of the work was undertaken by the nursing and midwifery staff. This midwifery section was equivalent to a maternity home within the confines of the hospital.

Thus in this system, there were three units which concentrated on special work and where suitable officers could be trained, while the bulk of routine midwifery was undertaken by a separate unit, the Maternity Home Unit.

In addition, there were 54 beds for paying patients (40 obstetric and 14 gynaecological).

The outpatient clinics were similarly re-organised, some as part of the Clinical Training Units, others as part of the Maternity Home Unit.

A Committee of Postgraduate Studies was formed to organise clinical conferences, postgraduate courses of lectures and symposia, reviews of hospital mortalities and to coordinate research. A Cancer Committee was also formed. This Committee was responsible for all patients with female genital cancer and the maintenance of a Female Cancer Registry. Its members included the Gynaecologists, the Radiotherapist and the Almoner.

The appointment of a Physician as the Medical Superintendent in 1962 resulted in another step in the upgrading of the services of Kangar Kerbau Hospital. A weekly Outpatient Clinic for women with medical complications of pregnancy was started. Daily ward rounds were conducted in all the wards, obstetric and gynaecological, to see women with medical problems. Medical emergencies, especially in the Labour Wards, were dealt with promptly. A weekly teaching session for medical students on the medical complications of pregnancy was also started. These duties were in later years borne by two other Physicians, Professor Feng Pao Hsui and Dr Chee Yam Cheng.

As the result of the re-organisation of the hospital,

posts in the Training Units were recognised by the Royal College of Obstetricians and Gynaecologists in 1963. The University Unit had three posts recognised for the full period of two years, while the Government Units had six posts recognised for 18 months each (which meant that the trainees had to work in a recognised post in the United Kingdom for six months).

The number of deliveries remained high. There were 39,598 deliveries in 1964; 38,849 in 1965 and 39,856 in 1966.

An American team of doctors and science personnel from the Hooper Foundation at the Medical Centre in San Francisco, was attached in 1964 to the Premature Baby Unit to carry out observations on pulmonary hyaline disease in newborns, and also to assess the efficacy of a surface active substance in the treatment of the disease. Professor Wong Hock Boon, Professor of Paediatrics, was closely involved in this project.

A start was made in 1964 to have a cytological service for the hospital, and a doctor was sent to the United States for postgraduate training. The University Unit established its Cytology Unit in May 1965.

Racial riots in July and September 1964 placed heavy strains on the hospital and the staff who had to man it during the curfews. The hospital had to deal with increased numbers of births. Maternity homes and midwives in private practice stopped work, and women in labour were brought in by police cars, etc. The average daily deliveries increased from 110 to 160.

Charges were made for deliveries undertaken in "C" Class wards where these had been performed free of charge previously. The charges were at the rate of \$10 for Singapore citizens and \$50 for non-Singaporean citizens.

1965 saw the opening of a branch of the Blood Transfusion Service in the hospital. In the Paediatric Unit, work on Kernicterus in Singapore by Professor Wong Hock Boon and Dr W R Brown, a Research Associate of the Hooper Foundation was completed. Arising out of this valuable work, all newborns in Singapore are now screened for Glucose-6-Phosphate Dehydrogenase deficiency. This work by the Paediatric Unit has been accorded world-wide recognition.

Ante-natal classes in the Physiotherapy Unit started in September 1965.

The work of the hospital from 1962 to September 1967 was unequally divided and was dealt with by the smaller University Unit and the two larger Government Units which were also responsible for the Maternity Home Unit. From September 14, 1967, the work load was divided equally among the three units.

The number of births began to drop from 37,924 in 1967 to 36,727 in 1968, to 31,255 in 1969, and fell further in the 1970s to 23,553 in 1979, and still further in the 1980s to 13,572 in 1987.

By the late 1960s, domiciliary deliveries were becoming fewer and fewer with the general tendency for more women to confine in hospital, and with the decrease in births, the hospital's Domiciliary Delivery Service and Domiciliary Aftercare Service ceased functioning in 1968.

In the late 1960s, moves were initiated for the University to conduct examinations and confer higher degrees in the various medical specialties. These qualifications were to be of the same standard as those of Membership or Fellowship of the various Royal Colleges of the United Kingdom and the Commonwealth. The first examinations for the degree of Master of Medicine in Internal Medicine, Paediatrics and Surgery were held in 1970. The examination for the degree of

Master in Medicine in Obstetrics and Gynaecology was held in 1971. Needless to say, the senior staff of Kandang Kerbau Hospital played an important part in training and examining candidates for the Paediatrics and the Obstetrics and Gynaecology examinations.

Another feather in the cap of the hospital had nothing to do with work, teaching or research. Dr B H Sheares, former Professor of Obstetrics and Gynaecology, was elected by Parliament as the President of the Republic of Singapore and took the oath of office on 2 January 1971.

It is almost impossible to do modern-day research without money. Donations by the China Medical Board and the Singapore Turf Club in the early 1970s enabled the University Department of Obstetrics and Gynaecology to extend its laboratory facilities in the form of equipment and floor area. This resulted in more work and research done, especially metabolic and radioimmunoassay studies. The Department is a recognised centre in this part of the world for research and training in human reproduction. Other aspects of its research were also known eg. prostaglandins.

By 1975, Kandang Kerbau Hospital had 560 beds (372 for obstetric and 188 for gynaecological cases). In addition, there were 54 labour beds, 273 nursery cots and 191 special nursery cots.

In April 1975, the Midwives Act was repealed and a new up-to-date Act entitled the Nurses and Midwives Act was passed - "An Act relating to the registration and enrolment of nurses and midwives and for other matters connected therewith".

An important milestone in perinatal care was reached when a Breast Milk Bank was set up in the Neonatal Unit in February 1976.

The Anaesthetic Service was decentralised in September 1977, which meant that the Anaesthetic Unit at Kandang Kerbau Hospital was no longer under the control of the Senior Anaesthetist at the General Hospital. The Head became directly responsible to the Medical Director of the Hospital, which made the running of the unit easier, engendered a sense of belonging to the institution and made teaching and research programmes simpler to carry out.

In 1978, a 7-bedded intensive care area for close observation, monitoring and treatment of critically-ill patients was set up under the charge of the Anaesthetic Unit. This represented a landmark in the history and development of Kandang Kerbau Hospital.

The School of Midwifery had to give way to the Bukit Timah Road Widening Scheme. In February 1978, the School was transferred to the School of Nursing at the Singapore General Hospital, and the old building was demolished in May, thus closing a chapter in midwifery training in Singapore.

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After establishing an in-vitro fertilisation laboratory, the University Unit under Professor S S Ratnam embarked on an In-vitro Fertilisation and Embryo Replacement Programme in 1982. The first patient was treated in August 1982. The treatment was a failure, but the major research achievement was the success with the second patient which resulted in the birth of the first in-vitro fertilised baby (test-tube baby) in Asia on 19 May 1983. What was stunning was the record time of nine months from the start of the programme when the department succeeded in the first in-vitro fertilisation which resulted in the birth of a healthy male infant. Funds for this research came from the University, the Shaw Foundation and the Singapore Turf Club.

When the Obstetrics and Gynaecology Unit at the National University Hospital opened in October 1985, all the University doctors in the University Unit at Kandang Kerbau Hospital, with the exception of three, went over to the National University Hospital. The three University doctors who remained behind and some Government doctors deployed from the two Government units formed the reconstituted U Unit.

Less spectacular technological advances have not bypassed Kandang Kerbau Hospital. Ultra-sound machines were acquired in 1982. The hospital is included in the Ministry of Health's Computerisation Programme which was launched in April 1985. Laser equipment and a fully automated random access parametric chemistry analyzer were acquired in 1986.

For the past two decades, deliveries in the hospital kept on decreasing, and so did the number of maternal deaths. The maternal mortality rate was about 2 per 1000 live births in the 1950s, down to about 0.5 in the 1960s and about 0.2 in the 1970s and between zero and 0.1 in the 1980s. Professor English's hopes had come true. The infant mortality rate in Singapore has dropped from about 250 in the early 1920s to below 10 in the late 1980s.

The hospital beside the Canal in the Kandang Kerbau district will end its 132-year history as a Government Hospital on 31 March 1990. "Re-structuring" of the hospital began in 1989, and on 1 April 1990, the Hospital will come under the Health Corporation of Singapore. Plans are afoot to rebuild the hospital in Kampong Java Park, which is opposite the present hospital on the other side of Kampong Java Road.

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