A PROSPECTIVE STUDY OF INFANTS BORN TO MOTHERS WHO SUFFERED ANTE PARTUM HAEMORRHAGE AFTER THE 28TH WEEK OF PREGNANCY

A THESIS

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"A man may practice all the days of his life, and yet be never the wiser for his experience, if he neglects to make the proper observations, which that experience might suggest to him....where as the searcher of authors has the benefit of other men's experience, together with his own, and it is from the joint-concurrence of these, that we can hope for any considerable advancement of knowledge.

J. Friend, M.D.

From "The History of Physick" Part 1.,
London (1725).
(Written while he was committed to the
Tower of London for treason).

"If one should look at things as they grow from the beginning it would be the best method of study."

Aristotle.

CONTENTS

The regulations of the University of Adelaide for the degree of Doctor of Medicine require:

(1) A declaration that the thesis is the writer's own composition. This declaration may be found on page 104.

(2) An indication of where the writer considers the thesis to advance medical knowledge or practice. This subject is contained in the Conclusion on pages 99-103.

CONTENTS

CONTENTS

PART I - INTRODUCTION

Outline and current views on research in the Perinatal Period

It is not generally appreciated that the greatest risk to survival during an individual's lifetime is encountered in the perinatal period. Thus, until very recent times, medicine has devoted most of its energies towards an understanding of man's extra-uterine existence and has given much less attention to his intra-uterine environment.

An analysis of the trends in research during the past decade indicates an awakening of interest in the neonatal period.

Recent statements by prominent medical authors confirm these views:-

Nixon (1963) in the Foreward to "The First Report of the 1958 British Perinatal Mortality Survey stated:- "Perinatal Deaths account for the loss of thousands of potential citizens, apart from the parental grief which cannot be measured. The Perinatal death rate is also an index of the number of near deaths which may have occurred and present with defects,acquired in pregnancy,at a later date.

Like an iceberg, we see only a proportion of the ill results - the deaths. But we must not forget the submerged and larger fraction, - the near deaths and the harm they cause".

Barker - Chairman of the National Committee for Research in Neurological Disorders, (U.S.A.) stated:- "Accurate and statistically valid answers to many questions about the perinatal period would be a tremendous boon to medicine.

Blighted lives, a heavy financial burden on the families of afflicted children in general, are part of the price we pay for ignorance of the perinatal period".

Britt (1957) referring to "The Early Diagnosis of Cerebral Palsy" stated:- "It is generally true in medicine that the history is often the most important factor in establishing a

diagnosis and this is especially true in paediatrics....

Since an intact brain is essential to successful competition in life its preservation is of utmost importance to the individual".

Claireaux (1959) stated:- "The connection between certain forms of intracranial damage and the future development of cerebral function seems to be well established.

It is important to discover exactly what is this pattern of such damage to foetus and newborn".

The Reasons for the present Study

"Surveys and enquries make an intrusion into family life and they can be justified only if they are designed to answer questions which are worth answering, which have not been answered in any other way.....Spence (1954)

Miller (1964) stated:- "Rather more that 10 years ago the late Sir James Spence electrified a meeting of the neurological section of the Royal Society of Medicine - which on that evening was peacefully browsing over the problem of cerebral palsy....by saying "Neurologists hoping to make any real contribution to the aetiology or the prevention of the condition under discussion.. ...would be better advised to occupy themselves with prospective than retrospective research, and should seek the genesis of these cerebral conditions in the obstetric or neonatal unit"".

Benaron (1960) stated:- "The Best Studies are the Prospective Longevity studies which have documented histories recorded from periodic observation throughout the life of the individual. So far these have been few in number and have never covered the entire period from birth to maturity.

It is towards these developmental studies that future Research must be orientated".

Polani (1963) stated:- "In a large proportion of cases the origin of "cerebral palsy" is obscure, though to a number of people a label of "post anoxia" appears adequate in many instances.

It is particularly necessary that further study be made of these cases. Probably the approach to this through the study of "high risk" groups of mothers should be intensified.

MacKeith (1962) stated:- "Who in Britain is stopping hard to think about Ante Partum Haemorrhage?".

White (1959) stated:- "It is obvious that accidental haemorrhage is a potent cause of foetal wastage and infant morbidity, and until the problem is solved, the paediatrician's task of salvaging to the maximum extent, the "accidental" neonate remains".

Ingram (1964) stated:- "The Danger to the Foetus resulting from A.P.H. with its attendant disturbance of placental nutrition is well recognised".

Why do certain children suffer from the deleterious effects of perinatal asphyxia and others do not? There is all the difference in the world between the statement:- Asphyxia is detrimental to an infant and asphyxia may be detrimental to an infant.

This present Study is an endeavour to solve some of these above problems. It is a Prospective Study and a "high risk factor" Ante Partum Haemorrhage has been chosen.

As Barcroft wrote shortly before his death in regard to the initiation of breathing in babies:- "A life time might be spent in filling in the details".

Acknowledgements

I would like to thank the members of the Board of The Queen Elizabeth Hospital for permission to carry out this Study as part of my duties as Honorary Assistant Paediatrician to the above Hospital since its foundation, and to the Administrator for the help he has given me in allowing me the assistance of the secretarial staff.

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PART II - HISTORICAL SURVEY

The History of "Infant Studies"

"It is good that we should know the past of medicine; its failures and its follies, its strivings and its successes, they are chastening and stimulating..." Still (1931)

The care and study of the Newborn has formed part of the interests of man since time immemorial. The medicine of the Bible is especially noteworthy in the attention paid to the care of the Mother and the hygiene of the Newborn.

460-370 BC - Hippocrates

"The first to treat medicine as a practical study rather than a speculative philosophy"..(Celcus).

Ante Natal Development

In his Treatise - "On the nature of a child" - he points out that light is thrown on intra-uterine development by the study of chick eggs taken at different stages of incubation.

1st. Mention Cerebral Palsy

In spite of Archaic pathology - "The brain should become clear of phlegm before birth" - he then describes the various effects of failure of this "clearing" after birth - ending in death, or recovery "with traces left - either the mouth is drawn to one side or the eye or hand or neck... the damaged part of the body - being weaker or more incapable than the rest"...

Convulsions

"Convulsions occur most readily in children from just after birth up to the seventh year".

Infantile Hemiplegia

In some cases the attacks tend to recur again and again; where as in cases where weakness is left by the attack (infantile hemiplegia) the convulsive attack which ushered in the paralysis often never recurs...

(Still's History)

Born 384 BC - Aristotle

Was not a medical man but the son of a court physician. Among his writings on biology there are several references to children which were quoted again and again by writers on paediatrics even as late as the 17th Century. "On the history of Animals" - there is a description of the birth and the earliest days of the infant.

Neonatal Observations

"The division of the cord is the province of the nurse and requires intelligence that does not blunder....She must be quick witted in emergencies ....In the matter of the tying of the cord....if the knot comes undone the infant dies of haemorrhage".

Resuscitation

"Frequently the child appears to be born dead, When it is feeble....
Some nurses who have already acquired the skill, squeeze the blood back out of the cord into the child's body, and at once the baby who had previously been as if drained of blood, comes to life again.

Meconium

"There is evacuation of excrement, sometimes at once, sometimes soon after they are born". Women call it Meconium.

Neonatal Behaviour

"Babies after birth for the first forty days do not laugh or cry when awake, but sometimes at night they do both. Most of the time they sleep, but as they grow older they keep changing in the direction of wakefulness "....

Physiology

Aristotle was the first to study the physiology of the normal infant.

Eyes

"All children directly they are born, have their eyes bluish, but afterwards these change to the sort they are destined to remain"....

Measurements

He recognised the difference between the proportions of the body in the infant and in the older child. (From Still).

AD 98-117 - Soranus

Was one of the most learned critical and lucid authors of antiquity - most of his writings have been lost. He belonged to the early second century and died at about the time Galen was born. "Gynecology" - the most important has been preserved in the original Greek.

(The English Translation of Soranus Gynecology owes its origin to the initiative of Dr. Nicholas J. Eastman, Professor of Obstetrics and Director of Obstetrics at the John Hopkin's University).

Extract:- "On the Care of The Newborn".

Neonatal Examination

How to recognise the Newborn that is worth rearing:-

"Now the midwife, having received the Newborn, should first put it upon earth," (Custom of the day, Craven) "having examined before-hand whether the infant is male or female"....

1st Reference to conditions during Pregnancy affecting the Baby

"She should also consider whether it is worth rearing or not, and the infant which is suited by nature for rearing will be distinguished by the fact that its mother has spent the period of pregnancy in good health for conditions, which require medical care especially those of the body, also harm the foetus, and enfeeble the foundations of its life. Second by the fact that it has been born at the end of nine months....

Condition at Birth and establishment of Respiration

Furthermore by the fact that when put to earth it immediately cries with proper vigour; for one that lives for some length of time without crying, or cries but weakly is suspected of being so on account of some unfavourable condition. Also by the fact that it is perfect in all its parts".

Soranus writes 17 chapters in all on the General Management and Feeding and Development of the infant in the first months of life.

AD 130-200 - Galen

Maintenance of health of Normal Infant

He was a prolific writer - more than 100 Treatises on various aspects of medicine. Amongst the parts of Galen translated by Linacre was "How to preserve the Health of the Normal Infant".

Care of Newborn Cleanliness

He also dealt with the care of the Newborn, with special emphasis on cleanliness. "I have ordered him to be bathed and that she should change his napkins for clean ones, and when these things were done the infant has stopped kicking and has settled off in a long sleep".

AD 980 - Avicenna (The Arabian School)

Of all the Arabian physicians none was more famous than Avicenna (Ibn Sina) and none more frequently quoted by the early English writers in medicine.

Ante Natal Care

The general principle of ante natal care was recognised by him.

Health in Pregnancy and effect on Infant

"Let care be taken of the infant in his mother's womb, that no harm happen to his body.. ...let the mother's blood be kept in good order and let the excess of it, out of which the infant is formed be kept pure".

Paediatrics in Mediaeval Times

From the time of the Arabian Physicians until the Renaissance, there were no writers on paediatrics. In England the subject seems to have been almost in complete abeyance.

The Fifteenth Century

It was not until the invention of printing that the revival of learning really began so far as medicine was concerned. The universal adoption of Latin as the language of learning also helped.

1472 - Paolo Bagellardo (An Italian)

"On the regimen of infants in the first month" - dealt in detail with the care of the Newborn.... described Resuscitation.

Management of the Baby immediately after Birth

When the infant at God's bidding comes fourth from the womb, then shall the midwife without haste or roughness, having in her hand a linen cloth.. ..wrap the child therein and place it in her bosom and take heed withal whether the child be alive or not, - whether it show any blemish....whether it taketh breath or not....

Mouth to Mouth Resuscitation

If she find it be warm and not black, she shall blow into his mouth, if it be that he has no breathing"....

The French Physician, Pierre Tolet, published a book on the diseases of infants - (one of his poems translated into English).

Poor Neonatal Care

"Till now the babes oft died of ills unknown
For none was there with knill to succor them
of midwife or of Mother or of nurse
What service each showed give, no leech had told;".

The Sixteenth Century

At the beginning of the Century, England still lagged behind the other countries in her output of medical works particularly on the subject of children's diseases.

1512

In 1512 one of the most famous works on midwifery appeared. "Rosegarten" the work of Roesslin, a German, this was translated into many languages and it was the first book dealing with the care of infants translated into and printed in English by Richard Jonas and dedicated to "Lady Queen Catherine wife and most derely beloved spouse unto the most myghty sapient Christen Prynce Kyng Henry the VIII"....

1st Book translated in English 1545

There are various divisions but one -

Newborn

"Howe the infant newly borne must, be handled, nouryshed and looked to"....

1546

The first English book of Paediatrics "The Boke of Chyldren" by Thomas Phaer (Phaire). His fame in his own generation was not as a medical writer but as a writer of poetry.

He passes briefly over the management of the newborn but it suggests that perinatal child care was entrusted to the midwife, who was licensed by the Church and the only instruction she received was in the proper words of the Baptismal Sacrament. (Phayer - 1955).

1563-1636 Resuscitation

Louise Bourgeois - Midwife to Catherine de Medici - who assisted at the birth of the Dauphin (later Louis XIII) who was born in a state of asphyxia which she managed by blowing a spray of wine into the infant's mouth. (Ricci).

1577 The first advice on Infant Welfare

Ferrarus an Italian of Verona - suggested that a baby from the day of its birth - "Should

be placed under the supervision of a man trained in the art of preserving health".

1593 Ante Natal Care Health

Trunconnis writing in Florence in 1593 regarded ante natal care as a part of the preservation of Children's Health.

The Seventeenth Century

Queen Elizabeth I's reign was drawing to a close when the XVII Century began - but medicine lagged far behind England's glorious achievements in other fields.

In France however, the status and competence of the French midwife were far in the advance of her British counterpart, owing to the schools for midwives established by Mauriceau.

1668

There appeared in Paris "Traite des Maladie des Femmes Grosses" by Francois Mauriceau. (His obstetrical works were of lasting value and will be referred to in the history of Ante Partum Haemorrhage). His Treatise was translated into English by the distinguished Hugh Chamberlen, (who used the obstetric forceps secretly and so great was the resistance to medical interference in child-birth that they fled to Holland).

Anterior Fontanelle

Referring to the Anterior Fontanelle, Mauriceau says - "There are children who have it sometimes open till they are three years old, if not longer - a great sign of weakness of their natural head. It is usually quite closed at the end of two years".

1694

The first author to consider the proportions and weight of the foetus and the Newborn infant, to be worthy of Publication was Francoise Mauriceau - the great French Obstetrician of the 17th Century in the 4th edition of his "Traite des Maladies des Femmes Grosses". (Cone - 1961).

The Eighteenth Century

The Eighteenth Century ended this age of sorcery and superstition.

"For the first time since Hippocrates, the study of disease by recording and correlating of clinical phenomena came to be recognised as an almost unworked mine of information". (Still).

1729 — Jonathon Swift - "I have reckoned upon a medium that a child just born will weigh twelve pounds, and in a solar year, if tolerably nursed, will increase to twenty-eight pounds". (Cone-1961).

1741 — William Smellie - One of the greatest figures in British Obstetrics, described the treatment of asphyxia neonatorum, care of the umbilical cord, and the ill effects of cold. (Corner-1964).

1748 — William Cadogan published - "An Essay upon Nursing and Managements of Children from their birth to Three years of Age".

He stated, "Look over the Bills of Mortality, there he may observe that almost half the number of those that fill up that Black List are under five years of Age". (Bills of Mortality established by Henry VIII 1583).

1753 — The earliest correct reports of Birth Weight were made by Roederer - an outstanding German Obstetrician - in the paper to the Royal Society of Gottingen, he measured 27 full-term infants and found that the average weight of males, 6 lbs. 9 ozs., and females 6 lbs. 2½ ozs.

1761
Infant Mortality — William Buchan - his dissertation "On the preservation of infant life" was read and published in Edinburgh in 1761 - he based his dissertation on the terrible infantile mortality "One half of the human race" he says, "die in infancy".

Preventive Measures

Much has been written about their diseases, but nothing definite about preventive measure, which are the one thing needful for children....

1764

Michael Underwood - the most advanced writer on diseases of children in the 18th Century. "His Treatise on the Diseases of Children with Directives for the Management of Infants, from Birth;" remained the standard work on this subject for 60 years. (But made no mention of Birth Weight - Craven).

1st Mention of Familial Jaundice

In his chapter "Icteritia or Infantile Jaundice" - "There are not wanting evidence of this disease, both in the more slight and severe forms, being in some families hereditary...." (Singer and Underwood - 1962).

The Nineteenth Century

Paediatrics as a specialty was now becoming established in many countries.

The Nineteenth Century was the era of clinical observation, and the newborn child began to arouse interest. (Corner).

John Syer - in his "Treatise on the Management of Infants" (1812) is apologetic about his subject: "On the present occasion I must avail myself of one very essential preliminary requisition, that the general reader will not be discouraged by the unavoidable association of medical with other topics; nor the professional student shrink from a perusal of the work, through a hasty anticipation if its being exclusively dedicated to the nursery". He described neonatal jaundice and, like all the physicians up to modern times, advocated purging with calomel.

1828 — Billard - In France Billard (1800-32) published his Treatise correlating post-mortem and clinical findings and produced the First Classification of Infantile Diseases of any importance. (ABT's Paediatrics - 1923).

First Classification of Infant Diseases

In the German speaking countries interest in the diseases of children was equally active.

In the U.S.A. the growth of paediatrics ran parallel with that in the United Kingdom. (ABT).

1836 — Richard Evanson and Henry Maunsell - In 1836, Richard Evanson, Professor of Medicine, and Henry Maunsell, Professor of Midwifery in the Royal College of Surgeons in Ireland, devoted much attention in "A Practical Treatise on the Management and Diseases of Children" to the physiology of early life and stressed the high neonatal mortality rate: "The infant at birth may labour under certain morbid conditions, or it may suffer from accidents or diseases either peculiar to the first moments of existance or materially modified by the circumstances belonging to that period".....

1848 — Charles West - Charles West who has been described as "the most genial practitioner of the Art who ever lived" and who established the Children's Hospital in Great Ormond Street, (1852) - published his lectures on Midwifery and diseases of infancy and childhood. (The time honoured custom of combining these Subjects, since the writers of Ancient Times was still evident).

1861 — The classic paper to the London Obstetrical Society "On the Influence of Abnormal Parturition, Difficult Labours, Premature Birth, and Asphyxia Neonatorum on the Mental and Physical Condition of

Little's Classic Paper

the Child, especially in Relation to Deformities" - by W.J. Little, M.D. was a major landmark in the Study of the Newborn (and in particular to the Subject of my Thesis, Craven). (Little 1861).

Until that time it was assumed that if an infant survived even the most prolonged or arduous delivery - it had no permanent effect on him.

Indeed the President of the Obstetrical Society of London said that he had difficulty in discussing Dr. Little's paper because of the entire novelty and originality of the subject.

This seems strange especially as Shakespeare described this subject in the opening lines of Richard III.

> "I, that am curtailed of this fair proportion.
> Cheated of feature by dissembling nature,
> Deform'd, un finisht, sent before my time
> Into this breathing world, scarce half made up,
> And that so lamely and unfasionable
> That dogs bark at me as I halt by them.
> (Shakespeare).

Excerpe from Dr. Little's famous Lecture:-

"Nearly 20 years ago, in a course of lectures published in the 'Lancet' and more fully in a "Treatise on Deformities" published in 1853, I showed that Premature Birth, Difficult Labours, Mechanical Injuries during parturition to head and neck - where life had been saved, convulsions following the act of birth, were apt to be succeeded by a determinate affection of the limbs of the child which I designated,

Birth Trauma Convulsions

Little's Disease

Spastic rigidity of the Limbs of the Newborn, Spastic rigidity from Asphyxia Neonatorum".

Incidence

"I have however witnessed so many cases of deformity mental and physical traceable to causes operative at birth, that I consider the subject worthy the notice of the Obstetrical Society". Variations later:-

"I have observed that in impaired intellect from abnormal birth.... it varies much in degree..... it is often not sufficient to exclude the individual from family society".

Early Reference to Social Maturity

The first reference to Uterine Haemorrhage and its effects on the baby (also referred to in Little's paper was made by:

1853

Hecker in Berlin, describing the morbid anatomy of stillborn children, "The vessels and sinuses of brain engerged with blood, in children born dead, whether from interruption of placental or insufficient pulmonary respiration" caused by pressure on umbilical cord, premature separation of placenta, and uterine haemorrhage".

Dr. Barnes commenting:- "Dr. Little had brought before the obstetric world new matter for inquiry of the highest interest"....

"It is recorded of Samuel Johnson that, 'He was born almost dead and did not cry for sometime'".

Nervous Disorders

The name of Samuel Johnson was almost synonomous with intellectual grandeur - but he was well known to be affected with certain nervous disorders.

1856 - 1926

John Thomson - "The Father of Scottish Paediatrics". "He was engaged in one of the major problems of paediatrics - that of mental defect in infancy and early childhood".

(Veeder) 1937.

1923

John Thomson wrote a little Brochure called - "Opening Doors" which has a sub-title, "A Little Book for Mothers of Babies who are Long in Learning to Behave Like Other Children of Their Age". "It is written in words that can be understood by all those who have learned to read".

Infant Mortality 1762

Hugh Smith - (St. Andrews) reproduced in his book, "Family Physician", figures from the Bills of Mortality, 75% of all deaths occurred under 24 hours.

1837

The Registration of Births and Deaths Act 1837, (amended 1874) for the first time gave information as to births after the 28th week of pregnancy and infant deaths in England and Wales.

1869

In 1869 Dr. Farr of the Registrar General's Department was so appalled at the high infant mortality rate that he recommended the Obstetrical Society of London to undertake the first perinatal mortality survey. This showed that throughout the country 50-90% of births were attended by midwives only, often untrained and quite unequal to any emergency situation (Carnegie United Kingdom Trust 1917).

1892

Despite the agitation aroused by these findings, in 1892 a Parliamentary Select Committee considered that a large number of infant deaths was caused from inefficiency and want of skill of many midwives: "They are perfectly ignorant and make no attempt to resuscitate apparently stillborn children, they think that it is the will of God that they should die. If the child is alive, it is alive, and there it is, but if not they must leave it, that is all".

1891

Ballantyne's monumental description of the anatomy and physiology of infancy (1891) established the idea that there was a continuity through birth of perinatal life and its disorders. Of special interest are his classic descriptions of hydrops foetalis, and also of immaturity: "The premature infant is born with the skin and the skeleton and the organs of a seven months' foetus. He is called upon to play the part of a Newborn infant with the personalia of a foetus. He is admirably fitted to continue living in the uterus but is ill-provided to meet the exigencies of an extra-uterine existence".

The Twentieth Century

The Twentieth Century is the age of fact-finding. (Corner).

In 1900 the Infant Mortality Rate was approximately 150 per 1,000 live births, whilst in 1950 it was less than 30 per 1,000.

The age at which the majority of infants die is now also different from what it was at the beginning of the Century.

Neonatal Deaths

Deaths in the first four weeks of life, are termed Neonatal Deaths and these contributed 32% of all infants. In other words the post neonatal mortality rate fell between 1906 and 1955 by 90%, whereas the neonatal rate fell by less than 60%. (Heady, Meesman - 1959).

Infant Mortality in Australia

1895-1899	Infant Mortality	112.2
1900-1904	" "	98.2 (Neonatal 34.4)
1961-	" "	17.8 (" 13.46)

Improvement in public health - water supply - sewerage - garbage disposal and general sanitation -

immunisation procedures - antibiotics - Infant Welfare Clinics.

These are some of the factors involved in this change. (Brown & Campbell - 1963).

Still Births

Still Births - or late Foetal Deaths, are babes born after 28 weeks gestation who do not show any signs of life after separation from the mother..... (Butler and Bonham - 1963).

Progress since 1945 has advanced in three directions:

1. Greatly improved 'Schemes for Care' of Perinatal life.
2. Research.
3. Follow-up Studies.

This might be termed the age of the mass survey, necessitated by the National Health Services. (Corner).

Perinatal Deaths

The term used for the total of Still-births and early neonatal deaths (7 days in America, Great Britain and Australia).

1954

Baird Walker and Thomson (1954) - analysed 1,000 Still-births and deaths in the first week of life in an Aberdeen Hospital (1938-52).

In about one third of all cases, no cause could be postulated, though most infants were prematurely born. In about 10%, maternal toxaemia was the cause, and was especially important in the younger and older primipara. Whilst Ante Partum Haemorrhage accounted for another 10%.

Birth Trauma was responsible for 20% of deaths particularly among older mothers, with primigravida being most affected.

1963

The most recent survey "The 1958 British Perinatal Mortality Survey" under the Auspices of "The National Birthday Trust Fund". (The first report published in 1963 "forms the first attempt to gather obstetric data at a national level, for example, on Toxaemia, Ante Partum Haemorrhage and abnormalities of labour.) (Preface - Butler, "This project was unique, not only for this country, but for the world".)

The majority of neonatal deaths occur during the first week of life, and it is these deaths along with still-births that have been most resistant to reduction during the last twenty years.

The History of Ante Partum Haemorrhage

2nd Century BC

The so called comprehensive histories of obstetrics contain few references to bleeding late in pregnancy. In ancient times Soranus described the frustration of managing uterine haemorrhage.

"It is a grevious calamity, for it is impossible to treat it by pressure with the fingers, insertion of hooks, plugging with plegits, constriction with ligatures, or by stitching. The blood flows not only from the uterus, but from the vagina also. (Soranus Gynecology - 1956).

16th Century

Ambroise Pare (1510-90), more widely known for his reintroduction of podalic version in 1550 - had the courage to induce labour in the case of uterine haemorrhage - an unheard of procedure before this time, and devised an instrument for mechanically dilating the cervix. (Jameson - 1962).

17th Century

In the middle of the 17th Century Francois Mauriceau (1637-1709) of Paris - who was noted for his bold innovations and probably with no little difficulty had introduced the practice of delivering his patients in bed, instead of in old obstetrical chairs. To him with Justine Siegemundin (Court midwife to the Electorate of Brandenbur 1690, belongs the credit for introducing the practice of puncturing the Ammotic Sac to arrest the haemorrhage in placenta praevia. (Jameson - 1962).

Robert Lee (1839) in "An Historical Account of Uterine Haemorrhage in the Latter Months of Pregnancy"

"Before the commencement of the 17th Century, few facts of importance had been ascertained

respecting the causes and treatment of uterine haemorrhage in the latter months of pregnancy".

He refers to:-

Guillemeau (1609), who stated - "The placenta sometimes presents before the child....that the most expedient means of arresting the haemorrhage is to deliver immediately by passing the hand into the uterus and turning the child".

Lee (1842) also refers to Mauriceau, Paul Portal 1685, Giffard 1734, Levret 1761.

Levret - "who also advocated to deliver immediately by turning the child".

The Eighteenth Century

1752 William Smellie in his Treatise on the Theory and Practice of Midwifery. In the chapter on Placenta Praevia - "On the first appearance of flooding, the patient ought to be blooded to the amount of eight or twelve ounces, and venae section repeated occasionally according to the strength and constitution and emergency of the case. She ought to be confined to her bed, and be cool rather than warm.

If costive, an emollient glyster must be injected, in order to dissolve the hardened faeces that may be expelled early without straining"....

1775 Edward Rigby (1747-1821). (Photostat copy of Lecture from Wellcome Foundation.)

An Essay on Uterine Haemorrhage

Accidental Haemorrhage & Placenta Praevia

In this Essay we find a clear differentation of premature separation of the normally implanted placenta which Rigby designated "Accidental Haemorrhage" from Placenta Praevia which is called unavoidable haemorrhage.

This remarkable essay was well appreciated by Rigby's contemporaries, it went into several editions and was translated into German and French.

Among his unpublished papers is an account of his visit to Paris during the French Revolution. It was not until 1814 at the age of 67 that he took his degree in medicine.

(Thomas - 1935).

Rigby began his essay saying:-

"No circumstance that attend parturition exposes women to so much danger as profuse Haemorrhage from the uterus, towards the latter end of pregnancy, and in the time of labour; the art of midwifery is likewise in no instance, more at a loss in the case of means of relief of the patient. An enquiry in to the cause of them, and an attempt to improve the practice in such cases, cannot therefore be useless".

1783 The Royal College of Physicians (founded 1518) recognized midwifery as a special branch of medicine.

(Corner).

The Nineteenth Century

About the middle of the 19th Century medicine met with the influence of Science resulting from the Industrial Revolution.

The British Obstetricians of this period included men of great mental distinction under whom both knowledge and practice developed with great credit. (Kerr et al. - 1954)

At this time they were agreed as to "The Profound anxiety and grave danger of unavoidable haemorrhage from Placenta Praevia.

The maternal mortality was 30%.

The foetal (being aggravated by prematurity) - over 60%.

1858 — Robert Barnes (1858) advised "To arrest haemorrhage. To induce labour and to expedite delivery of the child - all with as much consideration for the child's life as the paramount interest of the mother's survival permitted".

1860 — Braxton Hicks (1860) introduced Bipolar version with an appreciable reduction in the Maternal Mortality but it diminished the already slender chance of the child's survival.

1878 — Charles Bell (1878) read to the Edinburgh Obstetrical Society in February.

"There is no complication in midwifery more to be dreaded by the accoucheur than placenta praevia, from the danger attending it to both the mother and child".

He discusses the opinions of Sir James Simpson and other eminent obstetricians on the subject of Placenta Praevia.

1890 — The recommendation of Caesarian Section by Lawson Tait was the next important advance.

(Tait - 1890)

The Twentieth Century

1910-1933 — This saw a changing attitude towards Caesarian Section in Hospital practice.

Accidental Haemorrhage — The term 'Accidental Haemorrhage', first used by 'Rigby' is still in Universal use. The term Abruptio Placentae, (from Ablatio Placenta, Holmes 1901), is in use in America and elsewhere and the

description, 'Premature separation of the normally implanted Placenta' is also in use Overseas.

(Douglas et al. - 1955).

A decade ago the terms, concealed, revealed and mixed, were used.

1928 Browne noted the frequency with which accidental haemorrhage occurred in cases of chronic nephritis, i.e. toxaemia and its association with retro-placental bleeding.

1955 Feeney stated that pre-eclampsia was responsible for 10% of his cases. High blood pressure in 9%. The remaining 81% had no definite aetiological factor.

1959 Townsend - analysing "the management and outcome of pregnancy in 588 patients, who had Accidental Haemorrhage" reported - no maternal deaths.

He decribed the foetal loss in booked and in unbooked cases.

The incidence of Foetal Distress was 1%

(It was the surviving babies in this series that were 'followed up' by Dr. J. Glyn White will be referred to later in this Thesis).

1962 Paintin - in "The Aetiology of APH" - described the neonatal mortality in three groups:-

Accidental Haemorrhage
Placenta Praevia
Haemorrhage of Unknown Origin

The perinatal loss was comparable with that due to major deformities of the Central Nervous System.

1963 Hibbard defines Abruptio Placentae as Premature Separation of the whole or part of a placenta implanted on the body of the uterus. He excludes the traditional pre-eclampsia, hypertension and trauma, as major cases of premature separation of the placenta and indicates the need to search for other factors. He suggests a pre-existing functional defect in the foeto maternal relationship.

He finds a constant relationship between abruptio placentae and folic-acid deficiency and demonstrates megaloblastic erythro-poiesis in a high proportion of cases.

In summarising, it has been impossible to refer to the near hundreds of articles read on the subject of Haemorrhage occurring after the 28th week of pregnancy. The outcome of the Perinatal life of the Baby is frequently included - but a prospective study of the development of the Baby was not encountered.

Placenta Praevia

The diagnosis and mangement of cases of Placenta Praevia have been well documented by many writers in recent yeare.

Among the more outstanding:-

1945

Macafee in Belfast and Johnson in America both of whom independently in 1945 advocated "Expectant Treatment" in the management of Placenta Praevia. Prior to their work the foetal mortality was approximately 50% and maternal not less than 5%. They stated that:-

Berkeley (1936) reported a maternal mortality of 7% and a foetal mortality of 59%,

and Browne (1939) reported 5.9% and 54% respectively.

1950

Johnson again referred to the improved "Fetal Salvage" and "Increased Incidence of Caesarian Section" in the treatment of Placenta Praevia.

1960

Cox stated - "The deduction of the presence of Placenta Praevia is probably the most important factor in the modern management of Placenta Praevia. It is important, to the Professional Obstetrician in the city hospital, it is more important to the lone practitioner in the country.....".

1961

Stallworthy stated - "In no branch of obstetrics has there been such a dramatic reduction in foetal mortality, as in the Expectant Treatment of Placenta Praevia."

He described "The Dangerous Placenta" - "the Low Lying Placenta and particularly the one attached posteriorly".

The History of the Relation of Perinatal Conditions and Later Development of the Child

At the time of commencement of this Study the facts relating to the above were as follows:-

The Role of Birth Trauma

Birth Trauma (stressed by Little just over 100 years ago), continued to focus attention in the years 1920-1930.

Doll et al. (1932) emphasised the role of Birth Injury in the book "Mental Deficiency due to Birth Injury".

Benda (1945) reported the development of mental deficiency in children who had suffered Birth Injury.

Ingram (1964) stated:- "I have tried to show that the causes of Cerebral Palsy are at least as complex as the causes of Still Births and Neonatal Deaths and that the importance of Birth Injury as a cause of some types of Cerebral Palsy have been over emphasised".

Birth Weight, Prematurity and Later Development

The association between a low weight at birth and later disturbances of "normal" development has been noted from time to time, since Little (1861) and Freud (1897). "They were puzzled however as to the nature of such an association". (Polani - 1958). Only in comparatively recent times, has the association between cerebral palsy and prematurity been put on a quantitative basis, by Evans (1948) and Asher and Schonell (1950).

Knobloch et al. (1956) reported that approximately 25% of surviving infants born with birth weight less than 1500 grams - were affected by major neurological defects; these children were seen again when they were between 3 and 5 years of age by Harper (1959) and these later studies indicated that at 3 years socio-economic factors were beginning to exert an influence.

Douglas (1956) - assessing the prematurely born at 2½ years - concluded that prematurely born children were not retarded in the pre-school period if allowance was made for the degree of prematurity.

Eastman et al. (1962) - writing on "The Obstetrical Background of Cerebral Palsy", state:- "It seems clear that the likelihood of a premature infant developing cerebral palsy increases pari-passu with the degree of prematurity".

McDonald (1963) - discussing the result of a survey in collaboration with the Society of Medical Officers of Health of 1,800 surviving children weighing not more than 4 lbs. (1800 grammes) at birth - noted that 6.3% developed cerebral palsy.

Drillien (1964) states:- "Among the many published studies of later intelligence in relation to low birth weight, there are few adequately controlled prospective investigators". She goes on to say - "There seems to be general agreement that larger babies over 4½ lbs. do not show any obvious impairment in mental ability".

Below this birth weight there is an increasing number of average dull, retarded and defective children as birth weight decreases.

Ingram and Russell (1961) - demonstrated that compared with full-term infants, premature babies of high birth weight show a threefold increase in the incidence of spastic deplegia, and those of lower birth weight a 70 fold increase.

Crosse (1961) states:- "The prognosis for infants showing signs of cerebral irritation, not due to kernicterus is fairly good, but prognosis must be avoided at first, because defects may not become evident for a few years". She subsequently states:- "Prematurity per se, is of less importance in relation to mental development of a premature baby than influence of heredity and socio-economic factors, and when prematures are matched with controls in such a way as to eliminate the influences of all these factors (and an allowance is made for the degree of prematurity during the early years) premature babies show little or no mental retardation".

The Role of Anoxia

A Symposium by the Council for International Organizations of Medical Science was held in London, October (1951).

Among their conclusions were the following:-

1. In the physio-pathological process governing pre-natal and post natal anoxia, the moment of passing from the stage of irreversibility cannot clinically be recognised.

2. Before birth, the classical signs of foetal distress probably indicate the end and not the beginning of the physio-pathological process of anoxia....

   It would be of great advantage to be able to recognise conditions of threatened anoxia while they are still reversible in order to institute prophylaxis.

Fetter (1953) - summarised the present position with regard to the significance of anoxia rather well:- "The effect of anoxia suffered during foetal or neonatal life on an infant who survives is difficult to determine".

Benaron et al. (1960) state:- "The obstetrician is seldom aware of neuropsychiatric disorders which develop in children subsequent to birth. These are rarely apparent during the neonatal period and if they are later brought to his attention it is usually accidentally by the mother, who seeks advice regarding consultation with a neurologist or psychiatrist".

Benda (1952) - found that 6 children out of every 100, because of emotional or intellectual inadequacies were not able to meet the requirements of a standardized community life. Many of these conditions had been associated with anoxia at birth.

Anoxia is said to occur when the oxygen supply falls below the physiological needs of the organism. The exact level at which this occurs is unknown in the human being.

Anoxia as measured by the oxygen saturation of the umbilical artery's blood correlates poorly with post natal vigor.
(James et al. (1958)

Weisbrot et al. (1958) stated in this connection:- "In evaluating the biochemical status of a depressed infant a blood sample taken directly from the infant is more representative of his status, than is a sample from the umbilical artery".

As far as the future intellectual development is concerned:- "No significant correlation was found between the levels of blood oxygen content, measured in the first 3 hours after birth and intelligence as gauged by the Standford-Binet testing in early childhood. (Apgar et al. (1955)

The role of asphyxia in relation to the future development of the child falls into two schools of thought:-

Those who associate anoxia at birth and the later development of neuropsychiatric disorders.

And those who find no correlation between anoxia at birth and the subsequent development of neurological lesions, mental deficiency or behaviour problems.

Among other contemporary writers on this subject of anoxia are Windle (1950) - who studying the effect of anoxia in animals has shown that with sufficient insult to the brain, it is possible to produce behaviorial malfunctions analagous to human mental deficiency.

Studies of Bailey and Windle (1959) on newborn guinea pigs asphyxiated at birth have cast considerable doubt on the thesis that short asphyxial episodes are harmless. Preliminary studies on asphyxiated newborn monkeys show similar results.

Reid (1959) states:- "Vilee, an authority on the biochemical features of the foetus concludes that:- "the remarkable resistance of the mature foetus to hypoxia is not the result of some single

metabolic change, but is the result of a combination of several perhaps many alterations in metabolic patterns, each of which adds a small amount to the energy economy of the fetus. Added together these metabolic adaptations provide a considerable measure of safety to the fetus as it undergoes the birth process".

Mott (1961) states:- "There is a growing volume of work to show that indeed, at all ages the limiting factors in survival in anoxic or asphyxial conditions is the integrity of the circulation".

Burnard (1962) discussing "The Relative Dangers of Asphyxia and Mechanical Trauma at Birth", referring to cardio-respiratory disability he says:- "The latter arising independantly of the condition of the central nervous system may well be the crucial factor in many cases determining the recovery or otherwise in cerebral tissue which is already suffering the effects of asphyxiation during birth".

Walsh (1961) states:- "Apnoeaneonatorum in the majority of cases does not have a harmful effect on cerebral development (such apnoea we have termed uncomplicated...We have suggested that cardiac deficiencies and shock may contribute to cerebral involvement in the neonate".

Foetal Distress

"The universally accepted index of the status of the Foetus in utero is the Foetal Heart Rate". (Douglas et al. (1955)

Cox (1961) states:- "Foetal Distress is the observed manifestations of altered foetal behaviour caused in many cases by intrauterine anoxia". He records "a Perinatal Mortality of 4.5% in cases where delivery was not effected within 15 minutes, and suggests that earlier intervention might have improved results.

Cox (1963) - referring to Foetal Distress states:- "The delivery of infants before cardiac irregularity has appeared should appreciably lower perinatal mortality".

Lister and Buchanan (1957) - referring to "Foetal Distress and Neonatal Asphyxia" state:- "In more than half the asphyxiated babies in the neonatal period, there had been no evidence of foetal distress".

They refer to other factors having a direct bearing on Foetal Distress in Labour - primiparity was linked with the highest incidence of foetal distress and asphyxia, and again asphyxia becoming prominent in the 7th child.

They also found that Foetal Distress and the state of the child at birth, bore close relation to the weight (babies under 4½ lbs. showing significant variations in these two factors).

In the post mature child, there was also an increased incidence of Foetal Distress.

Walker (1959) concludes that:- "Foetal Distress, in our community is relatively common and carries a fairly high mortality". He refers to the danger of meconium staining and states:- "When it is associated with Accidental Haemorrhage and Pre Eclampsia - it is particularly dangerous...."

Referring to the sequelae he says:- "It is impossible to ignore the strong possibility that many babies who survive despite distress are permanently damaged".

Wood (1961) referring to Foetal Distress at Queen Charlotte's Hospital gives the following particulars:-

Foetal Distress was diagnosed in only 29% of anoxic still births. The perinatal mortality in patients with meconium in the liquor either alone, or with an abnormal foetal heart rate, was 3%.

Dawkins et al. (1961) - in an analysis of Intra Partum Asphyxia - summarise the major causes as "complicated vaginal delivery, premature placental separation and inadequate placental reserve - more than half the deaths occurred in association with maternal toxaemia".

Miller and Dundey (1962) in a retrospective study of 4860 cases from two teaching hospitals (one - The Queen Elizabeth Hospital where Craven's Study was conducted), the perinatal mortality in Foetal Distress was 4.8% (for the 2 hospitals).

The overall perinatal mortality was 1.9% (The Queen Elizabeth Hospital) and 3.2% for The Queen Victoria Maternity Hospital.

Approximately half the women with Foetal Distress had a normal pregnancy. They also found that:- In a foetus with signs of distress in labour - a gestational age under 36 weeks was a more lethal factor than a birth weight of 5½ lbs. (Perinatal Mortality 29% and 16% respectively).

Prospective Study

The most comprehensive Prospective Study in progress at the moment (1964) is probably "The Collaborative Research Project" conducted by The National Institute of Neurological Disease and Blindness, United States of America.

Berendes (1962) stated:- "The Collaborative Project for the Study of Cerebral Palsy and Mental Retardation and other Neurological and Sensory Disorders of Infancy and Childhood represents thejoint endeavour of 15 medical centres and the National Institute of Neurological Diseases and Blindness.

The Project came into official being in 1957. The objective of this Study is to determine the relationships between factors affecting women during pregnancy and the neurological and sensory disorders of their offspring".

50,000 pregnancies during a 10 year period -(such is the magnitude of this Project!) (Craven).

The Child at Risk

The concept of the child "at risk" is not a new one as has been seen by the historical survey.

"Ideally screening Tests for conditions which are not immediately obvious such as cerebral palsy or mental retardation as well as

metabolic disorders should be carried out on the entire population of infants.....but it is advisable to concentrate on those infants known to be specially "at risk" by reason of unfavourable family history, adverse conditions either before, during, or after birth, or show suspicious presenting symptoms in the first month of life."

(Sheridan (1962)

These "At Risk" clinics are now in operation under the Ministry of Health.

PART III - THE RESEARCH PLAN
- THE METHOD OF PROCEDURE

Research Plan

To study the incidence of Ante Partum Haemorrhage and its component parts (Accidental Haemorrhage and Placenta Praevia) in relation to:-

nationality*
maternal age
parity
length of gestation
history of pregnancy - with special reference to toxaemia and hypertension
mode of delivery

To study the correlation between the:-

condition at birth,
neonatal behaviour and management,
development and behaviour at six weeks (post natal visit)

To study:- (as near as possible to the 2nd Birthday)

the health,
development and
social maturity

Division into "Groups"

After the completion of the Medical Examinations, the infants studied were divided into groups, viz. - mild, moderate, and severe depending on:-

the amount and time of Ante Partum Haemorrhage
birth weight of baby
degree of foetal distress

A study was then made of each group in relation to the factors enumerated above.

Method of Procedure

It was proposed to study all the cases of Ante Partum Haemorrhage in the public beds at The Queen Elizabeth Hospital, South Australia during the years 1960, 1961 and 1962 inclusive.

The project was discussed with the Obstetricians in charge of three clinics, and also with the senior Resident Obstetrician Officer.

A pilot study as far as the six weeks examination was carried out by the investigator (Craven) on all "Ante Partum Haemorrhage" babies during 1959.

Maternal Aspects

The Resident Obstetric Officer informed the investigator (Craven) of the admission of a patient with haemorrhage after the 28th week of pregnancy.

Selection of Control Group

After consultation with the Resident Obstetric Officer a "control" was chosen from the next "nearest" patient who matched in - nationality, maternal age, parity, length of gestation, history of pregnancy, mode of delivery, sex and birth weight of infant and condition of birth.

*

The mothers admitted to the aforementioned Hospital are Australian born, United Kingdom born, and immigrants of European birth.

Neonatal Study

The infants in this study were under the direct control of the investigator from birth until the time of discharge from the Maternity Hospital.

The condition at birth:-

This was assessed in the following terms:-

the Apgar score
method of and response to resuscitation
clinical examination (general, physical and neurological)
congenital malformation

During the first 24 hours

A general physical and neurological examination was performed.

Fourth day

As on first day.

It was noted during the 1959 pilot study that there was a change in the neurological examination on the third to fourth day in the "controls" as compared with the "Ante Partum Haemorrhage" babies, and in the slight to severe degrees of Ante Partum Haemorrhage.

Day of discharge (average age at discharge - 10 days)

As on first day.

Sixth week examination (post natal visit)

General development and health, special reference to feeding and sleeping and neurological examination was performed by the investigator.

Two-year-old examination

General health, height, weight, milestones (sitting, standing, walking), behaviour (feeding, sleeping and talking).

Any evidence of abnormalities, convulsions, cerebral palsy, congenital malformations or any other special conditions were noted.

Social Maturity

The investigator at the completion of the two-year-old examination completed a form of the Vineland Maturity Scale by interviewing the mother (while also observing the child). Some of the questions were amplified by simple objective instruments such as:- books, toys, spoons, cups etc.

During this part of the interview the investigator tried to observe the principles of Doll, to be:-

> "Neither ingratiating nor hostile, neither sentimentally gullible, not unduly skeptical - but amiable sympathetic and objective".

The final figure of the Social Quotient was recorded for each child.

The Social Quotient

This is obtained by dividing the social age by the corresponding life age and multiplying by "100". (Doll, 1953).

Bias was minimised as far as possible by the investigator performing each examination with a "blank" case sheet.

It was realised that the elimination of bias, i.e. separate examiners at each phase, was not applicable to this study.

(Rules for the M.D. University of Adelaide - "The thesis will be the result of the personal study of the candidate").

NOTES ON SPECIAL EXAMINATIONS USED IN STUDY

The Apgar Scoring System

"In 1952 a scoring system was devised to evaluate the condition of infants born at the Sloane Hospital for Women, New York.

The need for a simple method, whereby the newborn's condition could be rapidly evaluated, was the main reason for the development of a scoring system".

"The condition of each newborn infant was expressed by a score, the sum of five numbers obtained in 60 seconds after complete birth. The numbers were determined by observations of heart rate, promptness and vigour of the first respiratory efforts, and reflex response to certain stimuli, muscle tone and color. The highest possible score was 10". (Apgar et al. - 1958).

Apgar Scoring - Predictive Value

The first results of the largest and most comprehensive study of perinatal factors have been reported to a "Work in progress" session in Washington.

"A series of reports analysing the performances of the Apgar scoring system in more than 17,200 deliveries showed that it is indeed an excellent guide to infant difficulties and later neurological problems". (Apgar - 1963, personal communication).

This scoring system was introduced to The Queen Elizabeth Hospital, South Australia by the investigator (Craven) after returning from a visit to the Presbyterian Hospital, Columbia University, New York in 1958.

Neurological Examination

Perhaps one of the best studies of the "Responses and Behaviour Patterns used in the Neurological Examination of the Newborn" in recent years was the study bearing the above title by Precht et al. (1960) and upon which the examination of the Central Nervous System of the newborn was made by Craven in this Study (see modified form used and designed by Craven -(Appendix XV.)

At this time they stated:- "The motor behaviour patterns of the human neonate are sometimes grossly disturbed because of injuries to the central nervous system which are caused by pre-natal and para natal complications".

Precht (1961) described a set of distinct syndromes of minimal brain damage in the newborn baby, among them being:-

The hypokinetic child and the "hyperexcitability syndrome".

Precht (1963) mentioned poor concentration span and other signs of "minimal" brain damage in follow up studies.

The Vineland Social Maturity Scale

Much thought was given to the choice of a scale suitable for the "Two-year-old Examination". The social adequacy of the individual as a whole was felt to be more revealing than the examination of separate factors of age, growth constitutional, family and environmental aspects, and intelligence tests.

Consultation with Dr. Norma Kent, psychiatrist to the Education Department, South Australia, confirmed Craven's choice of the "Vineland Social Maturity Scale". Furthermore it was revealed that this scale was in routine use by the Psychology Branch of the above department and that this would then be eminently suitable for repeat assessment of these children at a later age.

Craven then spent some time being instructed in its use and attended "day to day" work of the Department until it was felt that competence in its use had been attained.

PART IV - A STUDY OF ANTE PARTUM HAEMORRHAGE

1. Definitions

Ante Partum Haemorrhage is customarily defined as haemorrhage from the genital tract occurring after the 28th week of pregnancy, but before delivery of the baby.

"The 28th week limit is an arbitrary one related to the legal definition of a viable birth". Scott (1964).

This classification was adopted by Craven, as the perinatal period also starts at the 28th week and the title of the thesis fitted in well with the time of classification.

Perinatal Period

This period extends "from the 28th week of pregnancy to the end of the first week of life". Heady and Morris (1953).

2. Classification of Ante Partum Haemorrhage

The more recent classification of Accidental Haemorrhage, Abruptio Placentae and Haemorrhage of Uncertain Origin was not adopted at The Queen Elizabeth Hospital at the time of commencement of this Study (1960). The classification chosen by Craven was related to the amount and time of haemorrhage.

Placenta Praevia was ofcourse a separate clinical entity.

3. Incidence of Ante Partum Haemorrhage at The Queen Elizabeth Hospital

Total deliveries - 1960, 1961, 1962	= 7525	
Total cases of A.P.H. - 1960, 1961, 1962	= 261	Incidence 3.5%
Total cases of Accidental Haemorrhage	= 223	Incidence 3.0%
Total cases of Placenta Praevia	= 38	Incidence 0.5%

This overall incidence of 3.5% compares with - Scott (1964) 2-3%, Hibbard (1963) 2.79%, Paintin (1962) 3.0%, and Furler (Queen Victoria Hospital, South Australia - 1959-61) 4.4%.

4. "Hospital Population" at The Queen Elizabeth Hospital

Total deliveries - 1960, 1961, 1962 = 7525

"Australian" born mothers and "United Kingdom" born mothers } 60.9%

Mothers - immigrants from "Europe, Italy, Greece, Germany, Holland and the Balkan Countries" } 39.1%

5. Perinatal Mortality at The Queen Elizabeth Hospital

Total deliveries - 1960, 1961, 1962 = 7525

Still births 101
Neonatal death 102 } = 203 Perinatal deaths

Perinatal mortality per 1,000 total births = 27.0

Accidental Haemorrhage - Perinatal Deaths 10.6% (gross) *

Total number = 223 (gross still births- 14, neonatal deaths - 9)
(corrected still births- 12, neonatal deaths - 7)
- Perinatal Deaths 8.5% (corrected)

Perinatal Mortality per 1,000 births = 2.5

Placenta Praevia

Total number = 38 (gross still births- 0, neonatal deaths - 3)
(corrected still births- 0, neonatal deaths - 2)
- Perinatal Deaths 5.9% (corrected)

Perinatal Mortality per 1,000 births = 0.3

Perinatal Mortality for South Australia (1962) = 26.0

Perinatal Mortality Survey, United Kingdom (1961) (Butler) = 33.2

Perinatal Mortality, Queen Victoria Hospital, South Australia (1959-62) (Furler) = 34.0

* (See also Page 81)

6. Final Selection of Babies for Prospective Study

Accidental Haemorrhage - 193

Excluded were:23 (perinatal loss), 3 pairs of twins, 1 deserted wife and baby (adopted), 2 single girls (babies adopted). 1 mother with Torulosis during pregnancy was also excluded from the Study

Placenta Praevia - 35

TOTAL NUMBER OF BABIES IN PRESENT STUDY (including "controls") = 456

7. Attendances during Study

"6 weeks Examination" (also referred to as post natal visit)

12 patients did not attend	i.e. 6.2%
20 controls did not attend	i.e.10.4%

"2 Year Old Examination

21 patients did not attend	i.e.10.9%
20 controls did not attend	i.e.10.4%

Losses from the study groups have been minimal and have been due to movement of families interstate (although in some instances babies were brought from interstate, 100 or more miles, by their parents for the "2 year old Examination") The return of immigrants to their country of birth accounted for a very small percentage of non-attendances. Sometimes the family resided in a remote area of Australia and finally the refusal,or failure, to trace some of the families.

Drillien (1964) reported,in her survey of "The growth and development of Prematures", that 12% had been lost from the survey by the age of 5 years.

PART V - A STUDY OF INFANTS - BORN AFTER "ACCIDENTAL HAEMORRHAGE"

Group A

Babies 6½ lbs. and over at birth

Haemorrhage 5 ozs. or less. No foetal distress

In this group there were 51 babies:-

Normal delivery	:	45
Forceps delivery	:	4
Caesarian Section	:	2

The Normal Deliveries

The Apgar score was the assessment at birth.

The majority (43) the condition was good (Apgar 8+). No special resuscitation was carried out apart from aspiration of the mouth.

62/29 The Apgar was (8), but intra nasal oxygen was administered as well as aspiration.

62/11 The Apgar rating was (9) at birth but deteriorated, and was (6) at five minutes. Intra nasal oxygen was given in addition to aspiration.

The progress was good except in the following 7 cases:-

62/29 This baby remained "mucousy" for 24 hours - then there were no further difficulties during the neonatal stay in hospital.

62/11 This baby was "mucousy" for 24 hours but there were no further troubles at any time. The mother had a slight loss of blood at 32 weeks. This was treated by rest in bed at home. There were no further bleeds.

60/67 The baby's condition at birth was good, (Apgar 8) no special treatment was performed. The baby however remained irritable and had cyanotic attacks with prolonged periods of apnoea for four days. This mother had an Ante Partum Haemorrhage at 34 weeks which was reported as "slight". Her anaemia, however, was such that she was admitted to hospital for a blood transfusion. She was discharged and returned in labour - at term with a slight haemorrhage.

60/67 It is now questionable whether oxygen should have been administered when the Apgar deteriorated.

There were no problems in this group at the post natal or two year old examination.

Forceps Deliveries - Four

60/62 The Apgar was moderate (8) resuscitation was by aspiration and intra nasal oxygen.

61/68 No difficulties in neonatal period.

61/15 Apgar was moderate (6), (there were no special resuscitation procedures, no oxygen administered). Behaved well during neonatal period. At 2 years old he was a "very nervous" child. The SQ was 96.

60/78 Had a low Apgar, was given intra nasal oxygen. The baby remained irritable for 24 hours.

Controls

In three babies Apgar (6-8), one given intra nasal oxygen.

60/78C Apgar below five (5), intra nasal oxygen was given, the baby was irritable for 24 hours, then the condition remained satisfactory.

In all the Controls - the behaviour was normal at all times after the first 24 hours up to and including the 2 year examination.

Delivered by Caesarian Section - Two

60/33 Unbooked. Referred by General Practitioner. ? Placenta Praevia. Apgar good (9), intra nasal oxygen was given. There were no difficulties.

Controls

Good Apgar. No difficulties.

61/48 Difficulty with feeding at 2 years (? Mal-absorption Syndrome), but child taken home against medical advice before investigations were completed.

A	APGAR			Del.	No.	N.N.	P.N.C.	SQ At 2 Years
	Good	Mod.	Poor					
Controls	A			ND	60/9 61/61 61/72			110 100 100
					61/63 61/54 62/19			? 100 100
				F	60/35 61/31 62/76			100 100 100
				ND	60/9C 61/61C 61/72C			100 120 100
					61/63C 61/54C 62/19C			100 100 100
				F	60/35C 61/31C 62/76C			100 ? 100
Controls	IN02 IN02			ND	60/84 62/61			100 100
	IN02 IN02				60/84C 62/61C			100 100
Controls	A			CS	60/44 60/71 62/34			100 100 100
	A			CS	60/44C 60/71C 62/34C			100 100 100
Controls		IN02		ND	61/85			100
		IN02			61/85C			100
Controls		IN02		F	60/80			100
		IN02		F	60/37			120
		IN02		F	61/60	CNS & RS diff.4 days		95
		IN02		F	61/24			120
		IN02		F	60/80C			100
		IN02		F	60/37C			120
		IN02		F	61/60C			100
		IN02		F	61/24C			100
Control		IN02		CS	62/22			100
		IN02		CS	62/22C			110
Control			IN02 Dr.	CS	62/16			90
			IN02 Dr.	CS	62/16C			100
Control			IN02		60/23	CNS & RS diff.4 days	Hypertonic Tremors	82
			IN02		60/23C	CNS diff. 24 hours		100

Babies 6½ lbs. and over at birth

Haemorrhage 5 ozs. or less. Moderate Foetal Distress.

Note: Apgar Score

Good = 9-10
Moderate = 6-8
Poor = 0-5

ND = Normal Delivery
F = Forceps
CS = Caesarian Section
Br. = Breech
IN02= Intra nasal Oxygen
A = Aspiration
SQ = Social Quotient

COMMENTS

In this group there were 22 babies:-

14 good Apgar
7 moderate Apgar
1 poor Apgar

The normal deliveries all behaved well except 1 control who was "mucousy" for 24 hours.

There were two who exhibited difficulties in the neonatal period.

61/60 Forceps Delivery (moderate foetal distress). Intra nasal oxygen was administered. This baby was irritable for 4 days and had cyanotic attacks for the same length of time.

There were no problems during the post natal visit, or at 2 years old. The SQ was (95) (normal) and there were mild feeding problems, which were probably due to mis-management.

60/23 This baby's Apgar was poor at birth. Intra nasal oxygen was administered. There were respiratory difficulties, cyanotic attacks, prolonged periods of apnoea for 4 days. The baby was hypertonic, and disinterested in fluids for 4 days. At the post natal clinic the baby was hypertonic and had coarse tremors. His SQ was(82). The milestones were at the normal times, but he still showed feeding problems and sleeping difficulties.

A	APGAR Good	APGAR Mod.	APGAR Poor	Del.	No.	N.N.	P.N.C.	SQ At 2 Years
	A			ND	60/1 60/77			100 ?
					61/64			100
					61/62			96
					62/5			120
					62/47			100
Controls					60/1C 60/77C			100 ?
					61/64C			100
					61/62C			100
					62/5C			120
					62/47C			100
		IN02			60/6			110
		IN02			62/53			100
		IN02		F	62/24			?
Controls					60/6C			100
					62/53C			?
				F	62/24C			?
		A			61/17			90
Control					61/17C			100
			IN02		61/75	RDS CNS diff.4 days	Legs hypertonic	85
Control			IN02		61/75C			?

Babies 6½ lbs. and over at birth
Haemorrhage 7 ozs. or less. Marked Foetal Distress.

In this group there were 11 babies.

COMMENTS

6 babies - the condition at birth was good. It is interesting to note that:-

61/64 Had a congenital abnormality - a short left leg.

62/47 Developed scurvy at 1 year, which affected later milestones - even though they were normal at first.

One baby in this group suffered from sleep resistance but was otherwise normal.

In 4 babies the condition at birth was moderately good. One was "mucousy" for 24 hours but was subsequently well.

61/17 The Apgar was moderately good. The behaviour good during the neonatal period and the post natal Clinic, but the baby was irritable at two years. The child was slow at talking and there was a marked sleep resistance.

61/75 This baby had a poor condition at birth. Apgar (3). He was given intra nasal oxygen. There was marked respiratory distress for 24 hours and irritability of the Central Nervous System for 4 days with difficulty in sucking. At the post natal Visit there was a history of screaming attacks and the legs were hypertonic - ? Spastic. At two years SQ. was 85 and definite spasticity of legs was detected. The baby was very slow in talking. His delivery was normal, but he was an "emergency" (the mother gave a history of 2 episodes of bleeding and had received no ante natal care).

B	APGAR Good	APGAR Mod.	APGAR Poor	Del.	No.	N.N.	P.N.C.	SQ At 2 Years
Controls	A IN02 A			ND	60/42 61/61 61/12 61/46 61/53 62/21 62/49 62/75 60/72 60/11 60/28 60/3 62/20 60/42C 61/61C 61/12C 61/46C 61/53C 62/21C 62/49C 62/75C 60/72C 60/11C 60/28C 60/3C 62/20C			? 120 100 100 120 ? 100 ? 100 100 100 100 100 100 110 ? 120 ? 100 120 100 100 100 100 100 100
Control		A			60/43 60/43C			110 100
Controls		IN02	IN02 A IN02 Bx	F	60/49 61/69 61/67 62/72 60/49C 61/69C 61/67C 62/72C	RDS	CNS diff.	68 75 100 100 96 100 100 100
Controls		A A A		F F F	61/45 60/81 61/45C 61/81C	RS diff. 4 days	Hypertonie	90 100 120 120
Controle		A A		CS CS	60/29 61/66 60/29C 61/66C			90 100 100 100

Group B

Babies 5½-6½ lbs. at birth

Haemorrhage 5 ozs. or less. No Foetal Distress

In this group there are 22 babies:-

Normal delivery	:	17
Breech delivery	:	1
Forceps delivery	:	2
Caesarian Section	:	2

The Normal Deliveries

Condition at birth

The Apgar score was above (8) in 13 babies.

62/20 - 1 (a premature) required intra nasal oxygen.

All were completely normal during the neonatal period. At the post natal visit (3 did not attend) 10 were completely normal.

At the 2 year old Examination the 10 who attended were normal and healthy with a good SQ (Social Quotient) above (90).

Controls

All had good Apgar scores at birth, the neonatal stay was completely normal, as was the condition of all who attended at the post natal visit and the 2 year old Examination.

Poor condition at birth

60/43 The Apgar was (6), the baby was given intra nasal oxygen; the baby became jaundiced on the 3rd day and showed signs of irritability - an exchange transfusion was performed - the progress was subsequently good. The baby was well at the post natal visit and at the 2 year old Examination. (SQ - 110).

60/49 A premature baby, condition at birth poor, treated with intra nasal oxygen. This baby developed a Respiratory Distress Syndrome, the condition was improved but not completely satisfactory on the 4th day. At the post natal visit - the baby was irritable, poor general condition. At the 2 year old Examination SQ (68). The medical history revealed 2 episodes of Ante Partum Haemorrhage.

61/69 The Apgar was (7) (the cord was tightly "wound" round the baby's neck). Aspiration only, seemed to be necessary at this stage.

The baby however remained "mucousy" and irritable, cyanotic attacks continued until the 4th day. The weight gain was poor at the post nasal visit, but there were no other abnormal signs detected. At the 2 year old Examination the SQ was (75). The mother gave a history of two episodes of Ante Partum Haemorrhage.

61/67 Apgar (8), intra nasal oxygen given to the baby. The baby was well at all times. SQ at 2 years (100).

Controls

Well at all times.

Forceps Deliveries

62/72 Breech delivery. The Apgar was poor (3), intra nasal oxygen was given, the baby remained"irritable for 4 days" - but was quite well on the day of discharge from hospital. The baby was well at the post natal visit and at 2 years SQ was (100).

The control was irritable and mucousy for 24 hours and was then well at all times (SQ - 100).

61/45 Apgar (7), aspiration only. Cyanotic attacks on 4th day. Sucking still poor at time of discharge from hospital. At the post natal visit the baby was hypertonic and there were still sucking difficulties. At the post natal visit the baby was considered "small". There was a history of sleep resistance and "Temper Tantrums". SQ (90) at the 2 year old Examination.

The control - Apgar (7), aspiration only. Sucking difficulties on the 4th day but subsequently well. The weight gain was not satisfactory at the post natal visit but there were no difficulties then or at the 2 year old Examination. (SQ - 100).

60/81 Apgar (9) - well at all times. (SQ - 120).

B	APGAR			Del.	No.	N.N.	P.N.C.	SQ At 2 Years
	Good	Mod.	Poor					
	A				60/21			100
					60/45			100
					61/21			100
					62/31			?
					62/42			100
				F	60/20			120
				F	60/50			100
	IN02			F	61/80			100
Controls					60/21C			100
					60/45C			100
					61/21C			100
					62/42C			120
				F	60/20C			100
				F	60/50C			100
	IN02			F	61/80C			?
					61/3			90
Control					61/3C			?
			IN02		62/26			96
Control		IN02			62/26C			100

Caesarian Section Deliveries

* 60/29 Apgar (10). Neonatal condition good at all times. At the 2 year old visit the baby was healthy. SQ (90), but this was probably due to the fact that the mother worked "full time" and that Granny "brought" up the child - with very little stimulation.

* 61/60 Normal at all times.

* Listed on Page 49a.

The group with Mild Foetal Distress

In this group there were 10 babies (including 2 prematures).

60/21 - Normal delivery
60/50 - Forceps delivery

In 8 the Apgar was goodapart from one baby who was "mucousy for 24 hours". These babies were well at all times and had high SQ's at 2 years of age.

61/3 One baby, who had a moderately good Apgar at birth, developed a neonatal infection (the mother had had ruptured membranes for over 48 hours). Penicillin and Streptomycin were given to the baby. The baby was well at the post natal visit but at the 2 year old Examination, he was thin, and not talking (SQ - 90).

62/26 Apgar poor, intra nasal oxygen was given. Again, the baby developed a respiratory infection after a history of "ruptured membranes" for 48 hours. (SQ - 96) The baby was healthy.

Controls

All satisfactory.

C	Good	APGAR Mod.	Poor	Del.	No.	N.N.	P.N.C.	IQ At 2 Yeare
Controls	A				61/11			?
					61/39			100
					62/58		?	?
					61/11C			100
					61/59C			100
					62/58C			?
		A			61/16			100
		IN02			61/6	RS + sucking diff. 24 hours		100
		A			61/25	RS + sucking diff. 4th day		90
		IN02			62/2	?	?	?
		IN02			62/15			96
		IN02			62/55	RS diff. 4 days		85
		IN02			62/57			100
		IN02			62/65	RS diff. 24 hours		100
Controls		A			61/16C			100
					61/6C			100
					61/25C			?
					62/2C		?	?
		IN02			62/15C			100
		IN02			62/55C			100
		IN02			62/57C		?	?
		A			62/65C			100
			IN02		60/54 60/15	CNS & RS diff. 4 days		100 120
			IN02		60/77 61/35			75 51
			IN02		62/60			85
Controls			IN02		60/54C 60/15C			120 120
			IN02		60/77C 61/35C			100 100
			IN02		62/60C			100

Group C

Babies 6½ lbs. and over at birth

Haemorrhage 5-20 ozs. No Foetal Distress.

In this group there were 16 babies.

In 5 the condition at birth was good. There were no problems at any time at the post natal or 2 year old Examination. SQ's good.

In 8 babies the condition at birth was moderately good - Apgar (6-8). The majority were given intra nasal oxygen. At the 2 year visit 2 had an unsatisfactory weight gain but were otherwise normal.

61/25 Was aspirated only. This baby had cyanotic attacks and difficulties with sucking on the 4th day. Talking was a little slow at the 2 year old Examination.

62/15 Respiratory difficulties were still evident on the 4th day although there were no other abnormal clinical findings during the neonatal period or at the post natal visit. At 2 years old he had a cardiac murmur which was referred to The Adelaide Children's Hospital and a diagnosis of a congenital heart lesion - an inter ventricular septal defect was confirmed.

Controls

The controls in this group - apart from 2 who were "mucousy" for 24 hours - were all healthy and well developed at all times.

Five in this group had poor Apgar scores

60/77)
61/35) Were all irritable for 4 days and showed respiratory
61/60) difficulties too.

61/35)
62/60) Both gave history of feeding problems at the post natal visit.

61/35 Had a squint. At the 2 year old Examination, this baby's SQ was (51). There was a marked slowness in talking - milestones were delayed and sleeping problems were encountered.

Controls

Behaved well at all times (2 were "mucousy" for 24 hours).

C	APGAR Good	APGAR Mod.	APGAR Poor	Del.	No.	N.N.	F.N.C.	SQ At 2 Years
	A				60/79			100
	A				62/6			100
Controls	A				62/79C			100
	A				62/6C			100
		IN02			60/76			100
		IN02			60/16			100
		IN02			61/48		?	?
		IN02		CS	61/19			?100 (G.P. Report)
		IN02		CS	61/43			96
Controls		IN02			60/76C			100
		IN02			60/16C			100
		IN02			61/48C		?	?
		IN02		CS	61/19C			100
		IN02		CS	61/43C			100
			IN02		61/27	CNS & RS diff. 4 days	Hypertonic	85
			IN02	F	60/52			100
Controls					61/27C			?
			IN02	F	60/52C			100

Babies 6½ lbs. and over at birth

Haemorrhage 5-20 ozs. Mild Foetal Distress.

In this group there were 9 babies (including 1 Forceps Delivery and 2 Caesarian Section).

There were few problems in this group at any time apart from:-

62/27 In whom the Apgar score was poor and there were respiratory and Central Nervous System difficulties for 4 days. The baby was hypertonic at the post natal visit and at the 2 year old Examination the SQ was (83)

(In retrospect - resuscitation by intubation might have yielded better results in this case) (Craven)

The"Controls" were satisfactory and their development at 2 years was good.

C	APGAR			Del.	No.	N.N.	P.N.C.	SQ
	Good	Mod.	Poor					At 2 Years
Control	IN02 IN02			CS	62/35 62/35C			100 100
Control		A A			60/13 60/13C			100 120
Control		IN02 IN02			62/44 62/44C			100 100
			IN02		62/3	CNS 24 hours. NS 4 days diff.	?	100
			Intub	CS	62/68	CNS & NS diff. 24 hours		96
Controls			IN02 Intub	CS	62/3C 62/68C			? 100

Babies 6½ lbs. and over at birth

Haemorrhage 5-20 ozs. Marked Foetal Distress

In this group there were 5 babies

2 only had a poor Apgar score:-

62/3 Who remained irritable for 24 hours and who had cyanotic attacks for 4 days. The baby did not attend the post natal clinic or the 2 year old Examination. The parents lived in a remote district and a report from the General Practitioner said he was very well at "2 years" and gave no history of illness or problems at any time.

62/68 Delivered by Caesarian Section. The condition was poor at birth, there were difficulties with the Central Nervous System for 24 hours. At the 2 year old Examination the SQ was (96) but the child "over active".

Controls

No problems.

D	APGAR			Del.	No.	N.N.	P.N.C.	% At 2 Years
	Good	Mod.	Poor					
					61/13			85
	IN02				61/78			120
					62/1			100
					61/69			100
					62/66			100
	A			CS	62/54	RS. diff. 4 days		90
Controls	A				61/13C		?	?
	IN02				61/78C			100
	A				62/1C		?	?
	A				61/69C			100
	A				62/66C			100
	A			CS	62/54C		?	95
		IN02			60/27			95
		IN02			61/50			100
		IN02			62/39			96
		IN02			62/9		?	?
		IN02			62/38	Sucking diff. 4 days		120
		IN02		F	62/63			100
				F	62/71	CNS & RDS	Hypertonia of Legs	70
Controls		IN02			60/27C			100
		IN02			60/50C			100
		IN02			62/39C			100
		IN02			62/9C	?	?	
		IN02			62/38C			100
				F	62/63C	CNS & RS diff.		100
				F	62/71C	CNS & RS diff. 4 days	?	100

Group D

Babies 3½-6½ lbs. at birth
Haemorrhage 5-20 ozs. No Foetal Distress.

In this group there were 17 babies (5 Prematures).

61/13 The condition at birth was good. There were no problems during the neonatal period. Apart from a poor weight gain during the post natal Examination - there were no Abnormalities detected. At the 2 year old Examination the SQ was (85). There were sleeping difficulties; from the age of 8 - 18 months, talking was not good. It was noted that there were two episodes of bleeding which were treated by rest at home (in bed) by the General Practitioner. The patient was an emergency admission.

62/54 Who was delivered by Caesarian Section. The condition at birth was good. There were respiratory difficulties for 4 days. There were no abnormalities detected at the post natal visit. At the 2 year old Examination there were several behaviour problems. There were burns on Right Arm. The child had been involved in many minor accidents. (SQ - 90). He had been admitted to The Adelaide Children's Hospital with convulsions at 3/12 - they had not recurred.

The 5 premature babies in this group

61/30 Apart from restlessness at 2 years, this baby was normal at all times.

62/9 Was mucousy for 24 hours. Well at time of discharge from hospital, but did not attend further examination.

One premature baby:-

62/71 (Birth weight 3 lbs. 14 ozs.) was irritable for 24 hours and developed a Respiratory Distress Syndrome. At the post natal visit the baby's legs were hypertonic and he vomitted even with thickened feeds and sedation. At the 2 year old examination there was definite spasticity of both legs. (SQ-70).

D	APGAR			Del.	No.	N.N.	P.N.C.	IQ At 2 Years
	Good	Med.	Poor					
		IN02		CS	62/43	RDS		90
Control		IN02		CS	62/43C		?	95
			IN02		60/2			104
			IN02		60/63	CNS & RS diff. 4 days	Hypertonic Screams	70
			IN02		61/70			100
Controls			IN02		60/2C			100
			IN02		60/63C			100
			IN02		61/70		?	?

62/43 Caesarian Section (emergency admission from G.P.) also developed a Respiratory Distress Syndrome after 24 hours. This baby was generally hypertonic at 6 weeks and was admitted to hospital with feeding problems. At the 2 year old Examination the milestones were slow - he was not yet walking and the SQ was (90). He was "only just standing". He was slow compared with premature brother.

Controls

The controls in this group were well except 62/71C (birth weight 4 lbs. - a Forceps Delivery) - remained irritable for 4 days. There was a history of "colic" at 6 weeks but at the 2 year old Examination his SQ was (100) and the child "normal".
62/43C(Caesarian Section) gave a history of slowness in talking and "never sleeping". SQ (95) at 2 years.

Babies whose condition was "poor" at birth

In this group there were 3 babies (2 Premature)

60/2 (Premature) Apgar (4) at birth - well at all times (SQ - 104).

60/63 (Premature) 5 lbs. 6 ozs., poor Apgar (3). Irregular and prolonged periods of apnoea occurred for 4 days. The Moro and other reflexes were very hyperactive and prolonged. The baby was hypertonic at the post natal visit and the weight poor. Sucking was not good. At the 2 year old Examination (SQ - 70). The baby was thin. Milestones - standing and walking slower than Brothers and Sisters. Talking was not established apart from "Mum-mum" and "net". Sleeping was not good. He "dribbled a lot".

The controls apart from being "mucousy" for 24 hours were well at all times.

D	APGAR Good	APGAR Mod.	APGAR Poor	Del.	No.	N.N.	P.N.C.	IQ At 2 Years
	A				62/48		?	?
	A			F	62/18	CNS & RS diff. 4 days	Absent More (Rt.)	75
Controls	A				62/48C			?
				F	62/18C			100
		IN02			61/8	CNS Wide sutures 4 days	Wide Sutues	90
		IN02			61/65	RS diff.10 days		90
		IN02		F	61/56			100
		IN02		F	61/83	RDS	Tremors + Hypertonia	85
Controls					61/8C		?	?
					61/65C			100
				F	62/56C			100
				F	61/83C			100
		Intub.			60/69	RS & CNS diff. 4 days		90
		IN02	Poor Apgar	CS	60/22	CNS & RS diff. 4 days		90
		IN02			60/32	CNS & RS diff. 4 days	Hypertonia	80
Controls		IN02			60/69C	Sucking diff. 4 days	?	95
		IN02		CS	60/22C			120
		IN02			60/32C			100

Babies 3½-6½ lbs. at birth

Haemorrhage 5-20 ozs. Moderate foetal distress

In this group there were 9 babies.

Good Apgar scores at birth

62/48 This baby was well during the neonatal period but was not traced again.

62/18 Forceps Delivery. Remained irritable for 4 days. Cyanotic attacks and prolonged periods of apnoea persisted for 4 days. At the post natal visit the weight gain was poor, there were feeding difficulties - the baby "never stopped crying" and did not seem hungry, i.e. was not interested in feeding. The Moro was inactive on the Right arm - there was movement due to painful stimuli (pin-pricks). At the 2 year old Examination the child was a hemiplegia (Right arm).

Moderate Apgar scores at birth

61/3 This baby was irritable for 4 days. The sutures were widely separate. At the post natal visit - separation of the sutures was still evident and the baby was not thriving - referred to The Adelaide Children's Hospital. At the 2 year examination the child was small. (Father was a jockey and mother was 4 ft. 10½in.).(80-90).

61/65 The condition of this baby was not good, there were periods of dyspnoea for 10 days. Investigations did not reveal the cause, even though a congenital heart lesion was suspected. At the post natal clinic a cardiac murmur was heard, the baby was referred to The Adelaide Children's Hospital. At 2 years there was a history of repeated upper respiratory infections and a congenital heart lesion (probably an inter ventricular septal defect was diagnosed). The child was small for his age.

61/83 Birth weight (6 lbs.). Apgar (6), intra nasal oxygen given. Developed Respiratory Distress Syndrome. Hypertonic at the post natal Clinic. At the 2 year old Examination SQ was (85).

Condition poor at birth

In this group there were 3 babies.

60/69 A premature baby. This baby was intubated at birth. Apgar (3). The baby remained irritable for 24 hours cyanotic attacks occurred for several days.

At the post natal Clinic, apart from an unsatisfactory weight gain, the baby was normal. At the 2 year old Examination, there was slowness in talking and the child was not yet walking (SQ - 90).

60/22 Not a premature. Delivered by Caesarian Section - presented an almost identical picture at all stages.

60/32 A premature baby. The condition was poor at birth. Apgar (3). Resuscitation and the administration of intra nasal oxygen. There were difficulties with respiration for 4 days. The cry was high pitched and the neonatal reflexes very exaggerated. At the post natal visit, apart from an unsatisfactory weight gain, there were no abnormalities detected clinically. At the 2 year old Examination the child was most aggressive, the mother stated this was a constant worry to her. The child had been admitted to the Adelaide Children's Hospital with convulsions on two occasions.

(All the above are listed on Page 57a)

①	APGAR			Del.	No.	N.E.	P.N.C.	SQ At 2 years
	Good	Med.	Poor					
		IN02		F	60/68	CNS 4 days		90
Control		IN02		F	60/68C	CNS 24 hours		100
			IN02		61/47	CNS 24 houre RS 4 days	Hypertonic	65
			Intub.		62/12	CNS & RS 24 hrs.		100
			Intub.		61/55	CNS 4 days RS	Hypertonic	96
Controls			IN02		60/47C			?
			Intub.		62/12C	CNS 24 hours		100
			IN02		61/55C			100

Babies 3½-6½ lbs. at birth
Haemorrhage 5-20 ozs. Marked Foetal Distress

In this group there were 4 babies.

60/68 A Forceps Delivery, the Apgar score was (7) at birth. The baby was very restless for (4) days. At the post natal visit the mother stated that the baby was very restless. Clinically - no abnormalities were detected. At the 2 year old Examination SQ was (90). There were behaviour difficulties, particularly with feeding and sleeping.
(This mother had received no ante natal care) (Greek).

The control, apart from showing signs of cerebral irritation for 24 hours, was well at all times -(SQ - 100).

Three babies in this group - the condition was poor at birth

61/47 A thin post mature baby, was given intra nasal oxygen at birth. There were signs of cerebral irritation for 24 hours, but cyanotic attacks persisted for 4 days. At the post natal visit the baby was generally hypertonic, feeding was difficult as the "baby never relaxed" and the weight gain was unsatisfactory. At the 2 year old Examination the SQ was (65). There were sleeping difficulties. No attempt was made to talk apart from a few "unintelligible words". The gait was very unsteady. At the age of 7 months the child was admitted to The Adelaide Children's Hospital with fever and convulsions - they have not recurred.

E	APGAR Good	APGAR Mod.	APGAR Poor	Del.	No.	N.N.	P.N.C.	SQ At 2 Years
		IN02			62/28	CNS & RS 4 days	Hypertonic	75
			IN02 Br.	F	61/58	RS & CNS 4 days	Hypotonic	75
			Intub.	F	61/39	CNS diff. 4 days (Erbs Palsy)	Erb's Palsy	90
Controls		IN02			62/28C	CNS 24 hours		100
			IN02 Br.	F	61/58C	CNS 4 days	Facial Palsy	95
			Intub.	F	61/39C	CNS 24 hours		120

Group E

Babies 6½ lbs. and over at birth
Haemorrhage over 20 ozs.

62/28 This baby weighed 9½ lbs. at birth and was 7 post mature. (a gestation period of 42 weeks). The Apgar at birth was (5). Resuscitation by intra nasal oxygen. Respiration was irregular, with prolonged periods of apnoea for 4 days. Feeding was very slow during the first week. The baby was "limp" but the Moro reflex exaggerated and prolonged when disturbed. At the post natal visit the baby was generally hypertonic. Feeding still difficult because of "screaming attacks" and the weight gain unsatisfactory. At the 2 year old Examination the child was only just able to stand unaided and was not walking. There were few words. At 8/12 there was a history of convulsions associated with "teething". (SQ - 75).
(There were 2 episodes of bleeding - one of which was at 40 weeks and treated by rest in bed at home, the second occurred at 42 weeks during labour). (Mother Multi 6).

61/58 (Mother Multi 9).
Breech (no ante natal care). Forceps Delivery.
Apgar (5), intra nasal oxygen given. The baby was irritable and hypotonic for 4 days, cyanotic attacks recurred for 4 days. The baby was disinterested in feeding. At the post natal visit, sucking was still reported to be poor. The baby was hypotonic, very "grizzly when disturbed". The weight gain poor. (SQ - 75). Convulsions "out of the blue" at 10/12.

61/39 Forceps Delivery. Haemorrhage and marked Foetal Distress. Apgar score at birth (3). Intubation performed. There were intermittent attacks of cyanosis and twitching for 4 days. The

61/39 baby had an Erb's Palsy (L). At the post natal visit, the weight gain was not good, the baby was very restless. The Erb's Palsy was being treated with Physiotherapy. At the 2 year old Examination, the Palsy was much improved - good movements of both hands. The child was very shy and spoke only "Num-num" and "Sid". Feeding was also a problem. (SQ - 90).

Controls

62/28C) Were both irritable for 24 hours and then well.
61/39C) SQ 100 and 120.

61/38C (Breech) Forceps Delivery. Was irritable for 4 days and "mucousy" at times. A facial palsy was noted. At the post natal visit the facial palsy was much improved. At the 2 year old Examination - there was a very slight trace of the palsy. (SQ - 95).

(All the above are listed on Page 60a)

F	APGAR			Del.	No.	N.N.	P.N.C.	SQ At 2 Years
	Good	Mod.	Poor					
		IN02		CS	61/79			96
Control		IN02		CS	61/79C			100
			IN02	ND	62/52	RDS & CNS 4 days	Hypotonic	85
		IN02			62/45	RDS CNS & RS diff. 4 days	?	?
			Intub.	CS	62/7	CNS & RS diff. 4 days		90
			Intub.		62/14	CNS & RS diff. 4 days	Colic and Screaming	90
Controls			IN02		62/52 C			100
		IN02			62/45 C			?
			IN02	CS	62/7C			100
			IN02		62/14C			100

Group F

Babies 3½-6½ lbs. at birth
Haemorrhage over 20 ozs. No Foetal Distress.

61/79 (6 lbs.) Caesarian Section - because of Ante Partum Haemorrhage - continuous for 24 hours. (Multi 6).

The Apgar score at birth was (5). Intra nasal oxygen was administered, the baby was mucousy for 24 hours, but was well at all times. At the 2 year old Examination the SQ was (96). The mother reported that the baby "never slept" since 8/12 old.

The control, apart from being "Mucousy" for 24 hours was well at all times (SQ - 100).

Babies 3½-6½ lbs. at birth
Haemorrhage over 20 ozs. Mild Foetal Distress.

62/52 Birth weight (4 lbs. 1½ ozs.). Apgar (5). The baby was treated with intra nasal oxygen. The baby developed a Respiratory Distress Syndrome, which persisted for 4 days. Was very restless for the rest of the stay in hospital. Feeding was very slow. At the post natal visit, the baby was hypertonic. At the 2 year old Examination, the mother stated that all the milestones were slower than brothers and sisters. The baby was just standing at 2 years and was not walking. Talking was good. (Mother Multi 7 - two miscarriages).

62/45 Multi 6. No ante natal care. Labour followed artificial rupture of membranes for foetal distress. Apgar (3), intra nasal oxygen given. The baby developed a Respiratory Distress Syndrome after 4 hours. The baby remained irritable for 4 days and sucking was poor. The baby did not attend the post natal Clinic or 2 year old Examination.

62/7 Caesarian Section - for Foetal Distress and Accidental Haemorrhage. The Apgar at birth was (4). Birth weight (4 lbs. 14 ozs.). Intubation was performed. The baby was mucousy and had cyanotic attacks for (4) days, and intermittent oxygen was given for this length of time. Feeding was "slow". The baby did <u>not</u> attend the post natal clinic. At the 2 year old Examination, the SQ was (90). Speech was slow, but the child was rather shy and had a quiet disposition. Mother stated there was a "poor response to talk training".

62/14 Forceps delivery - because of Foetal Distress and Accidental Haemorrhage. Apgar (3) at birth. Intubation was performed. The baby was "flat" at first. Sucking was poor for several days and the baby was "jumpy" when disturbed with exaggeration of the reflex for 4 days. At the post natal visit the mother stated the baby screamed all day and night and had colic (the weight gain was <u>good</u>). At the 2 year old Examination SQ was (90). The mother stated that the child had never slept through the night since leaving the maternity hospital. Talking consisted of "Mum-mum" only and the child pointed at objects for attention.

The <u>controls</u> were satisfactory at all times. (SQ - 100).

(All the above are listed on Page 62a)

F	APGAR			Del.	No.	N.N.	I.N.C.	SQ At 2 Years
	Good	Mod.	Poor					
		IN02		ND	61/51	RDS & CNS for 4 days	Coarse Tremors	80
		Intub.		CS	61/18	RDS CNS & RS 4 days	?	65
			IN02		62/7	CNS & RS 4 days	Absent Moro ? Spasticity Legs	65
Control		IN02			61/51C			100
		Intub.		CS	61/18C			100
			IN02		62/71C			?

Babies 3½-6½ lbs. at birth
Haemorrhage over 20 ozs. Marked Foetal Distress.

61/51 Birth weight (3 lbs. 15 ozs.). (Mother Multi 5). Caesarian Section for Foetal Distress and Accidental Haemorrhage (concealed and revealed). Foetal Heart was not heard on admission but movements were felt.

The baby's condition deteriorated and she developed a Respiratory Distress Syndrome. Twitching persisted intermittently for 4 days and at the post natal visit the weight gain was unsatisfactory and coarse tremors were still noted. At the 2 year old Examination SQ was (80). The child was a twin, her mother stated she was a "whiny" baby and "teasy" - not like the others. Milestones were normal. She did not speak, apart from making "noises which the other children understand". "Makes no attempt to feed herself - other children feed her".

61/18 Birth weight (4 lbs. 8 ozs.) Mother hypofibrinogenemia - two previous prematures (Ante Partum Haemorrhage) - one a neonatal death. Caesarian Section - for Foetal Distress and Ante Partum Haemorrhage. Apgar (5) at birth. Intubation performed. The baby developed a Respiratory Distress Syndrome afterwards and had twitching of the face on several occasions for 4 days. The baby did not attend the post natal Clinic (lived 200 miles away). At the 2 year old Examination SQ was (65). The milestones were normal, but there was no attempt to say any words. There were two episodes of convulsions - one at 6 months with teething and one at 9 months associated with a high temperature and sore throat and ear infection. Sleeping had always been poor.

62/71 Birth weight (4 lbs. 5 ozs.). Marked Foetal Distress. Apgar (3) at birth, which responded to intra nasal oxygen. The respirations remained shallow and the baby was "dusky" for prolonged periods, in spite of oxygen. Sucking was poor and the Moro on the right side was not elicited.

62/71 At the post natal visit, absence of the Moro on the Right was still noted, although there seemed normal response to painful stimuli. Spasticity of both legs was noted.

At the 2 year old Examination SQ was(65) - there was a Right hemiplegia (arm and leg). The child did not sit up until 10 months. Was still unable to stand alone (hemiplegia) and said only a few words. Sister who was a small "prem" was much more advanced.

(In retrospect - would intubation have improved or avoided the respiration problem? Craven.)

The controls in this group, apart from being "mucousy" for 24 hours, were well at subsequent times. (2 had SQ's of 100). One did not attend.

(The above are listed on Page 64a)

G	APGAR Good	APGAR Mod.	APGAR Poor	Del.	No.	N.N.	P.N.C.	SQ At 2 Years
			IN02		61/23	CNS & RS diff. 24 hours		100
Control		IN02			61/23C	RS 4th day		95
		IN02			61/30	RDS	Colic Coarse Tremors	75
Control		IN02			61/30C			100
			IN02		60/17	RDS	?	90
Control					60/17C	RDS	?	90
			IN02		61/28	RDS+CNS diff. 4 days	Anaemia	95
Control			IN02		61/28C		Anaemia ACH Trans.	95
			IN02	F	61/29	RS & sucking diff. 4 days	Hypertonia Legs.Anaemia	60
Control			IN02		61/29C		?	?
			IN02	CS	62/40	RDS & CNS 6 days.Anaemia		90
Control			IN02		62/40C		Restless	95

Group G

Babies under 3½ lbs. at birth

In this group there were 6 babies

61/23 Slight Haemorrhage

The mother a young "para" 2. (1st baby 5½ lbs.) A slight haemorrhage at 32 weeks and went into labour (she had received no ante natal care).

Apgar score at birth (5), intra nasal oxygen given. After 24 hours, no further respiratory problems, the baby was rather hypotonic for a further 24 hours but subsequent stay in hospital was uneventfull. Baby was discharged after 5 weeks (weight 5½ lbs. Feeding - Lactogen). The baby did not attend the post natal Clinic (lived in country). At the 2 year old Examination the baby was well developed (SQ - 100). There had never been any problems or illness.

61/30 Slight Haemorrhage

Mother - primipara. Ante Partum Haemorrhage at 32 weeks. Admitted as an emergency from General Practitioner. In addition to the revealed haemorrhage there was a retro placental clot. The Apgar score at birth was (7). Intra nasal oxygen was administered. After 2 hours the condition deteriorated and the baby developed a Respiratory Distress Syndrome. Feeding was always difficult - the baby was hypotonic and had a poor sucking mechanism. There were repeated cyanotic attacks. At the post natal visit coarse tremors - generalised - were noted. There was a history of screaming attacks and colic and consequently "feeding was difficult". At the 2 year old Examination it was found that there had been two episodes of convulsions - at 10 months and 15 months. The milestones appeared normal, but the child "had not started talking", but seemed to understand quite well.

60/17 Moderate Haemorrhage

Concealed and revealed haemorrhage at 32 weeks. No ante natal care. Birth weight (2 lbs. 9 ozs.). Apgar score at birth (4). Intra nasal oxygen given. Good response but deteriorated after 6 hours and developed a Respiratory Distress Syndrome. There were feeding difficulties (but this was attributed to the small size of the baby). No other abnormal neurological findings. 80 c.c. of blood was transferred before discharge because of an Anaemia of 62%. The baby did not attend the post natal Clinic. At the 2 year old Examination the child was small but milestones were normal.(SQ - 90). There had been no illnesses or difficulties at any time.

61/28 Moderate Haemorrhage

Mother - primipara. Hypertension and albuminuria and haemorrhage at 32 weeks. Apgar score at birth (3). Intra nasal oxygen given - good response. Condition deteriorated and the baby developed a Respiratory Distress Syndrome and was hypertonic for 4 days. At the post natal visit the condition was good apart from a mild anaemia (82%) which was treated with "iron". At the 2 year old Examination the baby was "small" but well developed. Milestones were normal. Talking good. (SQ - 95).

61/29 Moderate Haemorrhage: Moderate Foetal Distress

Mother - primipara. An emergency admission from the country. Accidental haemorrhage at 32 weeks plus a large retro placental clot. Birth weight (2 lbs. 11 ozs.). Apgar (5). Good response to intra nasal oxygen. There were prolonged periods of apnoea and cyanosis associated with hypotonia for 4 days. Sucking was poor for several weeks. At the post natal visit there was hypertonia of both legs. There was an anaemia which responded well to "iron therapy". At the 2 year Examination, there was a definite spasticity of gastro nemii - the child was just standing (with support) and there was no attempt at walking (Xray hips excluded dislocation of hips). There were a few words. There was a marked hypertelorism. (SQ - 60).

(All the above are listed on Page 66a)

62/40 Moderate Haemorrhage: Moderate Foetal Distress

Caesarian Section. Accidental Haemorrhage, Foetal Distress and Transverse Lie. Birth weight (2 lbs. 2½ ozs.) Apgar (3). Good response to intra nasal oxygen. Respiratory distress developed after 2 hours. Cyanotic attacks and shallow respirations were still present on the 6th day and almost continuous oxygen was still necessary. Sucking was poor for many weeks. The baby developed a gastro enteritis during the 2nd week. Anaemia of 60% developed during the 3rd week and was treated by a small scalp vein transfusion. This baby was not brought to the post natal Clinic (Father a shearer's mate - parents lived in a caravan). At the 2 year old Examination the child was overweight and rather slow generally, not standing alone and not walking. There was a history of convulsions with teething at 8 months. The child made a few noises which "other children understand".

Controls

61/23C Birth weight(3½ lbs.). Apgar (6). Mother premature labour - ruptured membranes 48 hours. The baby developed an upper respiratory infection which was treated with tetracycline, progress subsequently good. At the 2 year old Examination the child was normal - a very "busy" child. Talking was rather slow (the teeth were stained yellow). (SQ - 95).

61/3C This baby was "mucousy" for 24 hours. Then well at all times (SQ - 100).

60/17C Birth weight (2 lbs. 12½ ozs.) Apgar (5). The baby developed a Respiratory Distress Syndrome after 2 hours. There were no abnormalities of the Central Nervous System at any time. The baby did not attend the post natal Clinic. At the 2 year old Examination the child was healthy but not walking. Talking was advanced - "never stops talking". (SQ - 90).

(All the above are listed on Page 66a)

61/28C (2 lbs.) at birth. This baby was "mucousy" for 24 hours. There were no "problems" at any other time. The weight gain was good at the post natal Clinic but the Anaemia required a blood transfusion. At the 2 year old Examination the milestones were normal (child walked at 13 months). Talking was good. (Mother however still kept the child in nappies).

61/29C Not traced since discharge from hospital.

62/40C Mucousy for 24 hours, then well. At the post natal Clinic there were feeding problems and restlessness. At the 2 year old Examination - an overactive, restless child. Mother reported he had <u>never</u> slept through a single night since her leaving the hospital. Talking good. (SQ - 95). <u>Over</u> anxious mother - only child.

(61/28c, 61/29c and 62/40c listed on page 66a.)

A note:- "The Mucousy Baby".

There have been many references in the previous pages to the "mucousy" behaviour of the baby during the first 24 hours of life. The significance of this description has been recorded by Desmond et al. (1961).

SUMMARY OF "INFANT STUDIES"

Group A				
APH Under 5 ozs. / Birth weight over 6½ lbs.	No Foetal distress		51	
	Slight	" "	22	
	Severe	" "	11	
T o t a l			84	= 43.5%
Group B				
APH Under 5 ozs. / Birth weight 3½ - 6½ lbs.	No foetal distress		22	
	Slight	" "	10	
	Severe	" "	0	
T o t a l			32	= 16.6%
TOTAL (A & B) i.e. APH Under 5 ozs.			116	= 60.1%
Group C				
APH 5 - 20 ozs. / Birth weight over 6½ lbs.	No foetal distress		16	
	Slight	" "	9	
	Severe	" "	5	
T o t a l			30	= 15.5%
Group D				
APH 5 - 20 ozs. / Birth weight 3½ - 6½ lbs.	No foetal distress		17	
	Slight	" "	9	
	Severe	" "	4	
T o t a l			30	= 15.5%
TOTAL (C & D) i.e. APH 5 - 20 ozs.			60	= 31.0%
Group E				
APH +20 ozs. / Birth weight over 6½ lbs.			3	
Group F				
APH +20 ozs. / Birth weight 5 - 20 ozs.			8	
TOTAL (E & F) i.e. APH +20 ozs.			11	= 5.8%
Group G				
Birth weight under 3½ lbs.			6	= 3.1%
T o t a l			193	= 100%

PART VI - DEDUCTIONS, COMMENTS AND STATISTICAL SIGNIFICANCE OF INFANT STUDIES IN ACCIDENTAL HAEMORRHAGE

1. Birth Weight and Social Maturity

The historical section summarises some of the published studies of prematurity and low birth weight and its relation with later intelligence, but as Drillien (1964) states "there are few adequately controlled prospective investigators".

This Study (Craven) suggests that BIRTH WEIGHT IS STATISTICALLY RELATED TO SOCIAL MATURITY at 2 years, but inspection of the R. value reveals that this correlation is not high.

B. Wt. V SQ. $.001 > P > .001$ R = .2908

This finding is significant, as it has occurred as the result of a controlled prospective study where a particular risk factor - Ante Partum Haemorrhage - has been chosen.

These results show similar trends to the studies on prematurity and low birth weight of Knobloch et al. (1956), Douglas (1956), McDonald (1963), and Drillien (1964).

It is difficult, however, to make comparisons as these references concern the various factors associated with the lowest weight prematures, and not with the specific subject of Ante Partum Haemorrhage and its relation to birth weight and subsequent development.

Ingram and Russell (1961), however, noted that birth weight per se was a factor associated with the later development of spastic diplegia.

2. Ante Partum Haemorrhage and Social Maturity

This Study (Craven) has revealed that ANTE PARTUM HAEMORRHAGE CAN ENDANGER THE LIFE OF THE FOETUS.

Inspection of Figure 1 and the corresponding Table of Perinatal Mortality Page 81 also reveals this finding.

ANTE PARTUM HAEMORRHAGE ADVERSELY AFFECTS THE CONDITION OF THE INFANT AT BIRTH, as judged by the APGAR SCORE.

APH V APGAR .001 > P R = .6291

It will be seen that this correlation is highly significant.

ANTE PARTUM HAEMORRHAGE ADVERSELY AFFECTS THE SOCIAL COMPETENCE OF THE CHILD at 2 years of age.

APH V SQ. .001 > P R = .5154

Inspection of R. value shows that this is of statistical significance.

When BIRTH WEIGHT and ANTE PARTUM HAEMORRHAGE are considered together and correlated with diminished SOCIAL MATURITY at 2 years of age. Inspection of R. value shows that this correlation is statistically significant.

B. Wt. + APH V SQ. .001 > P R = .5164

The views of contemporary writers on this subject of ANTE PARTUM HAEMORRHAGE and PERINATAL MORBIDITY are interesting, but few references, however, are to be found as to the later fate of the surviving infants of such pregnancies.

Macbeth (1955) tabled Placenta Praevia and Accidental Haemorrhage among the "Causative factors in the Aetiology of Prematurity".

Eastman (1957) referred to bleeding in the last half of pregnancy as a causative factor in cerebral palsy. This is also emphasised by Lilienfeld and Parkhurst, (1951 and 1955).

Townsend (1959) reported the foetal wastage in Accidental Haemorrhage, and White (1959) reported the morbidity in the surviving babies.

Ingram (1964) referred to the danger to the foetus resulting from Ante Partum Haemorrhage.

Inspection of Figures 2 and 3 and the corresponding Tables on Pages 82 and 83 indicate the relationship of Ante Partum Haemorrhage and Perinatal Morbidity in this present Study (Craven).

3. Foetal Distress and Social Maturity

The relation between Foetal Distress and the Social Competence of the child at 2 years of age is not statistically significant.

FD V SQ. $.02 > P > .01$ R = .2394

There is a statistically significant correlation between the APGAR SCORE (condition of the baby at birth) and SOCIAL MATURITY at 2 years. A low Apgar score probably indicating diminished Social Competence.

APGAR V SQ. $.001 > P$ R = .3779

When the APGAR SCORE and the degree of FOETAL DISTRESS are considered together and related to SOCIAL MATURITY, it will be seen that this correlation, although not high, is more significant.

FD + APGAR V SQ. $.001 > P$ R = .3868

It is interesting to compare these findings with the retrospective study of Miller and Bundey (1962) and Cox (1961 and 1963) even though they refer to Perinatal Mortality only, and its relation to Foetal Distress.

Walker (1959) concluded that Foetal Distress was dangerous when associated with Accidental Haemorrhage and Pre-eclampsia and to the possibility of permanent damage to the surviving babies of these pregnancies.

4. Behaviour in the first 24 hours and its relation to Foetal Distress and Ante Partum Haemorrhage.

It appears that the degree of FOETAL DISTRESS and the APGAR SCORE at birth when considered together have a high correlation with the behaviour of the CENTRAL NERVOUS SYSTEM and the RESPIRATORY SYSTEM in the first 24 hours of life.

CNS + RS (1st 24 hrs.) V FD + APGAR .001 > P R = .7024

Inspection of the R. value reveals that this correlation is highly significant.

Apgar (1963) refers to the value of the Apgar score as a "guide to infant difficulties and later neurological problems...."

5. Subsequent Behaviour in the Neonatal Period

(a) Behaviour in the first 24 hours and its relation to Social Maturity at 2 years.

In this Study (Craven) it has been found that the presence of RESPIRATORY DIFFICULTIES in the first 24 hours after birth is related to diminished SOCIAL COMPETENCE at 2 years of age.

RS (1st 24 hrs.) V SQ. .001 > P R = .4982

The presence of cerebral irritability during the first 24 hours, however, is not as significant in its correlation with impaired Social Maturity at 2 years.

CNS (1st 24 hrs.) V SQ. .01 > P > .001 R = .3123

The presence of RESPIRATORY DISTRESS and the signs of CEREBRAL IRRITABILITY in the first 24 hours, when considered together, have a highly significant correlation with diminished SOCIAL MATURITY at 2 years of age.

CNS + RS (1st 24 hrs.) V SQ. .001 > P R = .5096

Schaeter and Apgar (1959) demonstrated statistically significant relationships between the clinical criteria of perinatal asphyxia and signs of brain damage in childhood.

Ernhart et al. (1960) referred to intelligence scores and their relationship to perinatal anoxia.

(b) <u>Behaviour on the 4th day and its relation to Social Maturity at 2 years of age</u>.

In the "pilot study" in 1959, Craven noted that the less severe signs of cerebral irritation disappeared on the 4th day of extra uterine life in babies born after slight (less than 5 ozs.) Ante Partum Haemorrhage,and in the "controls". This was not so in babies whose mothers gave a history of a large Ante Partum Haemorrhage (20 ozs. or more), or repeated episodes of Ante Partum Haemorrhage.

From this Study Craven postulated that the persistence of abnormalities in the Central Nervous System on the 4th day of life and later, indicated residual damage to the Central Nervous System. This was substantiated by the present Study.

Signs of CEREBRAL IRRITABILITY which are still persistent on the 4th day of life are related to diminished SOCIAL MATURITY at 2 years.

CNS (4th day) V SQ.(2 years) .01 > P > .001 R = .3161

These are statistically significant values.

Difficulties of RESPIRATION on the 4th day are also related to diminished SOCIAL MATURITY at 2 years.

RS (4th day) V SQ.(2 yrs.) .01> P >.001 R = .2956

Inspection of R. value reveals that this correlation is not high, though the finding is statistically significant.

(c) Behaviour on the day of discharge from hospital and its relation to Social Maturity at 2 years.

In this Study - the day of discharge from hospital varied from 7-10 days, in the case of the larger baby, to several weeks, in the case of the very small premature baby (who was discharged when a weight of 5½ lbs. or over was attained.)

Signs of abnormality in the CENTRAL NERVOUS SYSTEM at this time was significantly related to diminished SOCIAL MATURITY at 2 years of age.

CNS (discharge day) V SQ.(2 yrs.) .001> P R = .3564

The correlation between respiratory problems at this time, however, and impaired Social Competence at 2 years is not significant.

RS (discharge day) V SQ. (2yrs.) .1> P >.5 R = .1023

It is interesting to compare these findings with those of Craig (1950) who discussed the relationship of cerebral irritability in the newborn and permanent sequelae.

Keith et al. (1950) who described neurological lesions in the newborn, and Keith et al. (1953) - "Neurologic Lesions in relation to the sequelae of Birth Injury".

Frechtl et al. (1963) described the signs of "minimal brain damage" in follow up studies of infants who had shown signs of disturbed behaviour patterns in the perinatal period.

6. <u>The Post Natal Examination (6 weeks of age) and its relation to Social Maturity at 2 years</u>.

The post natal Examination of the mother six weeks after delivery is now considered a "routine" in present day Obstetrical Management, but the medical literature is lacking in "studies" of the baby at this time.

This Study (Craven) has revealed that the examination of the baby by a trained paediatrician at this time is of the utmost importance. Examination of the baby and particularly of the CENTRAL NERVOUS SYSTEM AT 6 WEEKS OF AGE CAN PREDICT EARLY ABNORMALITIES.

CNS (6 weeks) V SQ. (2 yrs.) $.01 > P > .001$ R = .3049

This correlation is statistically significant.

In conclusion it may be indicated at this stage that the above findings which have been submitted for statistical analysis are original contributions to Medical Knowledge and in particular to the Management of Ante Partum Haemorrhage and the care of the BABY born after such pregnancies.

7. The Height and weight of infants born after "Accidental Haemorrhage" and compared with the "controls".

Height and weight measurements have been studied in the various groups (summarised on page 70) and compared with the "control" babies in the same groups.

The statistical analysis of these results have revealed the following facts:-

Group A

APH Under 5 ozs.

Birth weight over 6½ lbs.

The height and weight of the babies in the "Accidental Haemorrhage" group is diminished in comparison with the "control" babies. This finding is statistically significant.

Height:- $.01 > P > .001$ Weight:- $.01 > P > .001$

Group B

APH Under 5 ozs.

Birth weight 3½ - 6½ lbs.

The findings are the same as in Group A.

Height:- $.05 > P > .02$ Weight:- $.01 > P > .001$

Group C

APH 5 - 20 ozs.

Birth weight over 6½ lbs.

In this group the differences in the measurements of height and weight of the "Accidental Haemorrhage" babies and the "controls" were not statistically significant.

Height:- $.2 > P > .1$ Weight:- $.3 > P > .2$

Group D

APH 5 - 20 ozs.

Birth weight 3½ - 6½ lbs.

The height and weight measurements in this group showed that the "Accidental Haemorrhage" babies were shorter and weighed less than the "control" babies. These findings are statistically significant.

Height:- $.001 > P$ Weight:- $.01 > P > .001$

Group E and F

Accidental Haemorrhage over 20 ozs.

The height and weight measurements in this group showed that the differences between the "Accidental Haemorrhage" babies and the "control" babies were not statistically significant.

Height:- $.3 > P > .2$ Weight:- $.3 > P > .2$

Group G

Birth weight Under 5½ lbs.

There was a total of 12 babies in this group (6 "Accidental Haemorrhage" babies and 6 "control" babies).

For small numbers, such as this, the 'student' t test is not satisfactory for statistical analysis.

PART VII - FURTHER COMMENTS ON INFANT STUDIES IN ACCIDENTAL HAEMORRHAGE

The following subjects are discussed in this section:

1. Perinatal Mortality in relation to Ante Partum Haemorrhage.

2. Morbidity in relation to Ante Partum Haemorrhage.

3. Episodes of Ante Partum Haemorrhage in relation to social maturity.

4. Convulsions.

5. Hemiplegia and Spasticity.

6. Resuscitation and Neonatal Behaviour in relation to social maturity.

7. Patterns of pregnancy in Ante Partum Haemorrhage and in general hospital population.

The "findings" in this section have not been submitted to statistical analysis but it is suggested that the trends indicated should be studied in a larger series, the results of which might prove of considerable value to the advancement of medical knowledge.

Perinatal mortality in relation to Birth weight and A.P.H.

Fig.1.

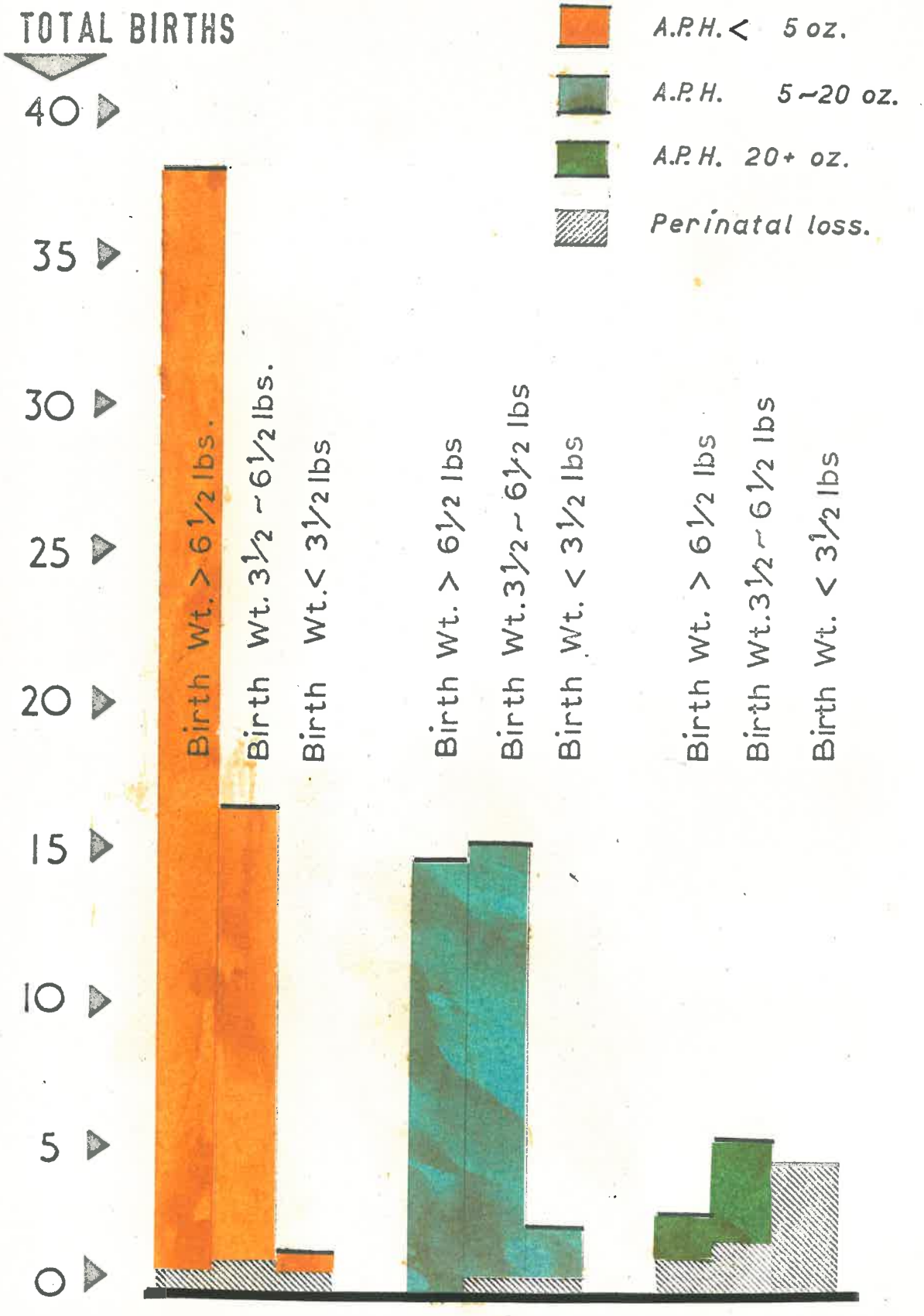

TABLE 1

PERINATAL MORTALITY IN RELATION TO BIRTH WEIGHT AND A.P.H.

Birth Weight (lbs.)	A.P.H. (ozs.)	No. Surviving	No. Perinatal Deaths	% Surviving	% Perinatal Deaths
Over 6½	5	85	1	37.2	0.5
3½ - 6½	5	34	2	15.5	0.9
Under 3½	5	2	1	0.9	0.5
Over 6½	5 - 20	32	0	14.3	-
3½ - 6½	5 - 20	32	1	14.5	0.5
Under 3½	5 - 20	4	1	1.8	0.5
Over 6½	20+	3	3	1.4	1.4
3½ - 6½	20+	8	4	3.6	1.8
Under 3½	20+	0	10	-	4.5
TOTAL BIRTHS		200	23	89.4	10.6

Figure 1 and Table 1 show the Perinatal Mortality in relation to birth weight and ante partum haemorrhage.

The Total Perinatal Mortality (uncorrected) being 10.6%.

The figure and table show the increasing perinatal mortality associated with the larger amounts of A.P.H.

It will be noted that there were 10 babies whose birth weight was under 3½ lbs. associated with A.P.H. of over 20 ozs., none of whom survived.

Morbidity in relation to A.P.H. *Fig: 2.*

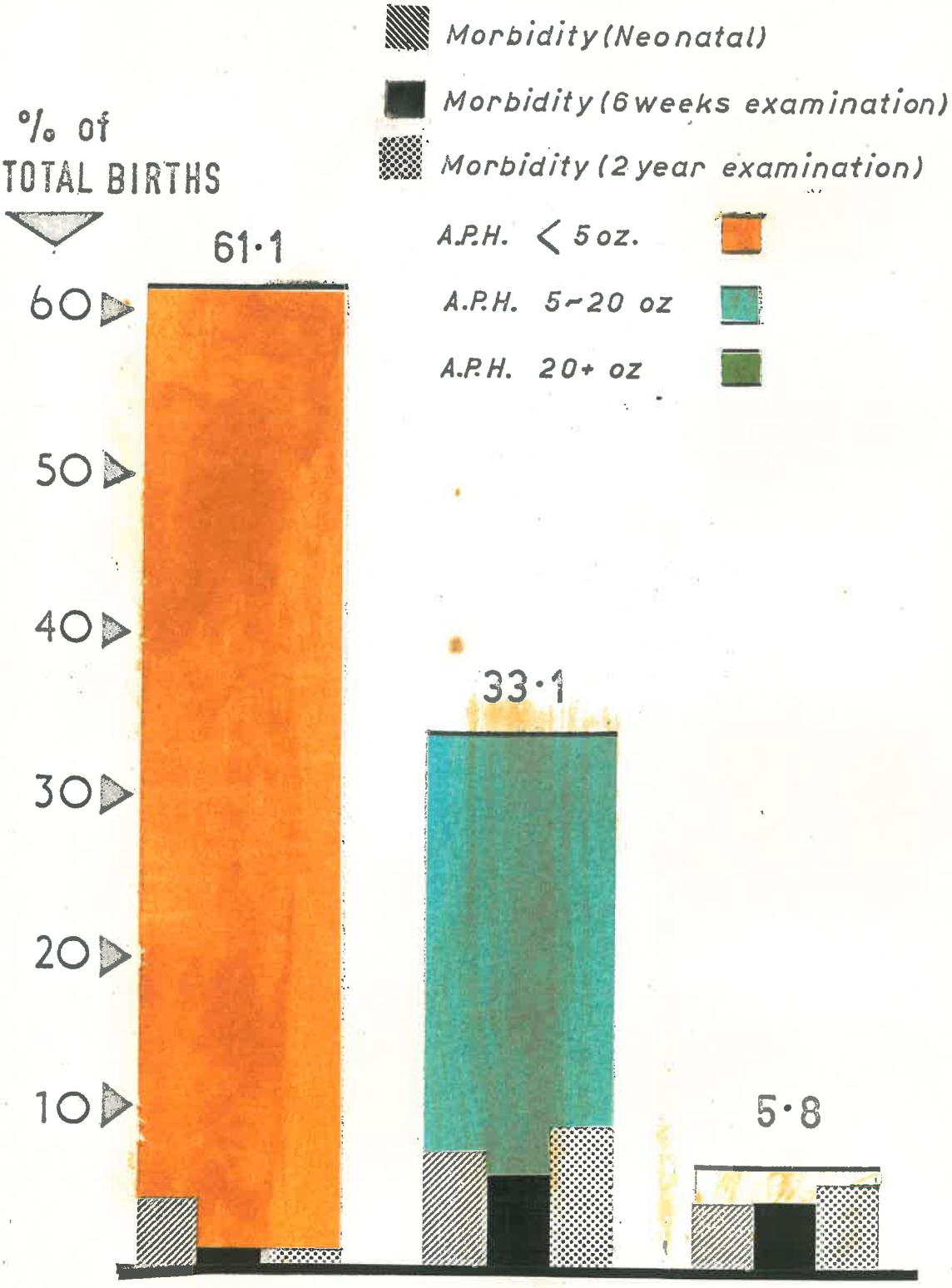

TABLE 2

MORBIDITY IN RELATION TO A.P.H.

	Total	%	Morbidity		
			Neonatal	"6 Wks." Exam.	"2 Yrs." Exam.
APH Under 5 ozs.	116	61.1	8	2	2
"Controls"	116		0	0	0
APH 5 - 20 ozs.	60	33.1	14	11	17
"Controls"	60		0	0	0
APH Over 20 ozs.	11	5.8	8	8	10
"Controls"	11		0	1	0

Figure 2 and Table 2 show the Morbidity of the surviving infants in relation to Ante Partum Haemorrhage.

It will be seen that Morbidity at the three periods - neonatal, 6 weeks, and 2 years of age, increases with increasing amounts of haemorrhage.

Morbidity in relation to Birth weight and Amount of A.P.H.

Fig; 3.

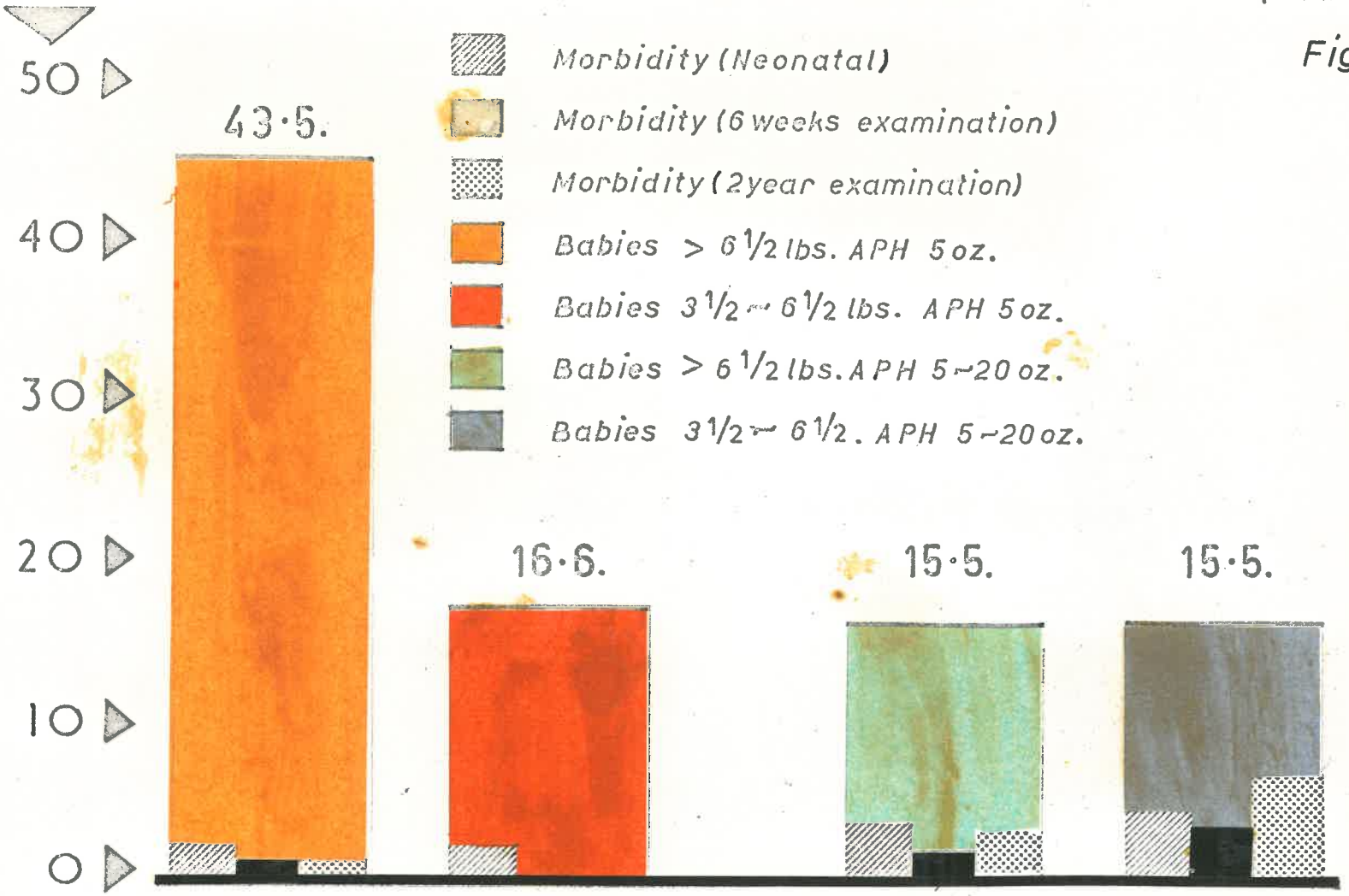

TABLE 3

MORBIDITY IN RELATION TO BIRTH WEIGHT AND A.P.H.

	Total	%	Morbidity		
			Neonatal	"6 Wks." Exam.	"2 Yrs." Exam.
APH Under 5 ozs. Birth Weight Over 6½ lbs.	84	43.5	4	2	2
"Controls"	84		0	0	0
Birth Weight 3½ - 6½ lbs.	32	16.6	4	0	0
"Controls"	32		0	0	0
APH 5 - 20 ozs. Birth Weight Over 6½ lbs.	30	15.5	6	4	5
"Controls"	30		0	0	0
Birth Weight 3½ - 6½ lbs.	30	15.5	8	7	12
"Controls"	30		0	0	0

Figure 3 and Table 3 show the morbidity in relation to birth weight and ante partum haemorrhage.

It will be seen that when the haemorrhage is less than 5 ozs. there are few neurological or other complications at the three periods studied. When however, the haemorrhage is 5 - 20 ozs., there is a difference in the morbidity between the larger and the smaller babies. It would appear therefore, that smaller babies withstand the hazards of ante partum haemorrhage less well than the larger babies.

Comparison of Figures 1, 2 and 3 show the similar pattern of perinatal mortality and morbidity in the three examination periods. It is interesting to compare these findings with Lilienfeld et. al. (1955) that morbidity among infants born after ante partum haemorrhage is a "continuum of reproductive wastage".

TABLE 4

SOCIAL QUOTIENT IN RELATION TO EPISODES OF A.P.H.

Social Quotient	No. of Infants in Group	No. of Mothers with two Episodes of A.P.H. in Group
100 - 120	108	1
100 - 90	40	10
90 - 75	10	10
75 - or less	15	14
	173 *	

The Social Quotient of the Child and its relation to the number of episodes of ante partum haemorrhage.

This study reveals that the social competence of the child (expressed as the Social Quotient) is diminished when there is a history of more than one episode of bleeding before delivery.

It is interesting to note in Table 4, the increasing number of pregnancies with more than one episode of A.P.H. occurring in association with the lower social quotient scores.

* There were 193 infants in the "Accidental Haemorrhage Group", 20 did not attend the 2 year examination.

TABLE 5

CASE SUMMARIES OF BABIES OF ACCIDENTAL HAEMORRHAGE GROUP WITH SQ.75 OR LESS

Number	Parity	"APH" Episodes/Wks.	Time Delivery/Wks.	Neonatal Behaviour						Social Quotient	Remarks
				Birth Weight	Apgar	Resuscitation	1st Day	4th Day	"6 Wks. Exam."		
APH Under 5 ozs.											
60/49	5+	36 40	40	4:0	6	0	+	+	+	68	
61/69	1	36 40	40	6:6	6	A	+	+	+	75	
APH 5 - 20 ozs.											
60/74	2	32 36	36	6:10	5	0	+	+	+	75	
61/35	3	32 36	36	6:11	5	0	+	+	+	51	
60/63	3	36 40	40	5:6	5	0	+	+	+	70	
61/71	2	32 36	36	5:14	5	0	+	+	+	70	
60/32	2	34 36	36	4:1	3	0	+	+	+	70	Convulsions
62/18	4	34 36	36	5:13	8	A	Absent Moro		+	75	Hemiplegia
61/47 Br.	4	36	36	5:9	3	0	+	+	+	65	Convulsions
APH 20+ ozs.											
61/58 Br.	9	42	42	7:0	3	0	+	+	+	65	Convulsions
62/28	6	40 42	42	9:8	6	0	+	+	+	65	Convulsions
62/71	2	36 36	36	5:8	3	0	Absent Moro		+	65	Monoplegia (arm)
62/18	2	36 36	36	5:2	5	ø	+	+	+	65	Convulsions
Babies Under 3½ lbs. weight at birth											
61/30	1	32 32	32		2	0	+	+	+	76	Convulsions
61/29*	1	28 32	32		1	0	+	+		60	Spasticity

A = Aspiration
0 = Intranasal Oxygen
Br. = Breech
+ = Morbidity
* = Mother over 42 yrs. of age
ø = Intubation plus oxygen

4. Convulsions

Table 5 summarises the case histories of children with impaired social competence at 2 years of age, i.e. Social Quotient 75 or less. It is interesting to discuss some of the factors thus revealed.

There were no instances of convulsions in the neonatal period in the infants "studied". Convulsions occurred in six of the children seen at the "2 year examination".

Further inspection of Table 5 shows that:-
Convulsions occurred in two babies (60/32, 61/47) when the ante partum haemorrhage was 5 - 20 ozs. and in four, when the bleeding was over 20 ozs. in amount.
61/58 was a "breech" and was "post mature" at the time of delivery and was the mother's ninth pregnancy.
62/28 was also "post mature" at the time of delivery and was the mother's sixth pregnancy.
62/18 was born after two episodes of bleeding at 36 weeks.
Convulsions occurred in one baby (61/30) whose birth weight was less than 3½ lbs.
It would appear from this study that convulsions in the child are related to ante partum haemorrhage in the mother, particularly when there is a history of more than one episode of bleeding, which is 20 or more ozs. in amount. "Grand Multiparity" and postmaturity are additional hazards.
In these children there is usually a high incidence of morbidity in the neonatal period.

It is interesting to compare these findings with the theory that convulsions should be regarded as a "continuum of reproductive wastage" (Lilienfeld and Pasmanick (1954)).

Keith et. al. (1953 and 1960) reported that convulsions in childhood, were not related to complications of pregnancy and asphyxia in the baby. The controversy which has occurred since the time of Little 1861 and McNutt 1885 as to whether asphyxia alone can cause permanent damage continues.

5. Hemiplegia

In this study (Craven) hemiplegia occurred in two children of the "accidental haemorrhage" group (see Table 5).

62/18 - Birth weight 5 lbs. 13 ozs. Apgar 8 - which deteriorated rapidly and a respiratory distress syndrome ensued. The baby still showed signs of cerebral irritation on the 4th day, and the Moro reflex was not elicited on the right side.

At the "post-natal" visit (6 weeks examination) "absent Moro" was again recorded. At the "2 year" examination a hemiplegia was confirmed. The S.Q. was 75. The mother had two episodes of "A.P.H.", toxaemia occurred and delivery was at 36 weeks gestation.

62/71 - Birth weight 5½ lbs. Apgar 3. Resuscitation (intra nasal oxygen).

The Moro reflex was not elicited in the right side on the 4th day. At the post natal visit, there were diminished movements of the right arm. At 2 years of age there was a definite Monoplegia of the right arm.

The Social Competence of both these children was impaired at 2 years of age.

The co-existence of convulsions, mental retardation and hemiplegia is well known (Tizard et. al (1954)).

McDonald (1963) reported the various types of hemiplegia occurring in cerebral palsy.

Craig (1950) referred to hemiplegia in "follow up" studies of babies who had "cerebral irritation" in the neonatal period.

Ernhart (1958) referred to hemiplegia in children in relation to perinatal anoxia.

Spasticity

Spasticity was found in two children in the "A.P.H. Group" at 2 years of age.

61/29 (Table 5) - The mother was a primipara - over 42 years of age. There was a history of two episodes of bleeding, one at 28 weeks' gestation (treated at home by the general practitioner). Premature labour occurred at 32 weeks and was

associated with a large retro placental clot (A.P.H. + 20 ozs.). At this stage the patient was admitted to hospital.

61/75 - There was a history of two episodes of A.P.H. The mother had received no antenatal care and was "an emergency" admission (page 48).

The baby's birth weight was 6½ lbs. There was a history of severe foetal distress. Apgar was 3. Signs of cerebral irritability were persistent on the 4th day and there were difficulties with sucking. At the post natal visit there was a history of "screaming attacks" and on clinical examination hypertonia of both legs elicited.

Spasticity occurred in two (60/82, 61/76) of the 35 babies "followed up" after a history of placenta praevia (page 92).

It is interesting to note that Lilienfeld et al (1955) referred to the "high association between Placenta Praevia and cerebral palsy.

The Athetoid Form of Cerebral Palsy

This form of cerebral palsy was not seen in this present study. This is in keeping with Woods (1963) and Neal (1963).

TABLE 6

CASE SUMMARIES OF BABIES OF ACCIDENTAL HAEMORRHAGE GROUP WHEN INTUBATION WAS PERFORMED

Number	Parity	"APH" Episodes/Wks.	Time Delivery/Wks.	Neonatal Behaviour						Social Quotient	Remarks
				Birth Weight	Apgar	Resuscitation	1st Day	4th Day	"6 Wks. Exam."		
APH 5 - 20 eps.											
60/59	3	35 33	36	4:14	3	ø	+	+		90	
62/68	4	36 36	36	6:8	3	ø	+	-		96	
62/68c	3	-		6:8	3	ø	+	-		100c	
APH + 20 eps.											
61/39	5	36	36	6:8	3	ø	+	+	+	90	Erb's Palsy
61/39c	5	-	36	6:8	3	ø	+	-		120	
62/14	2	36 38	38	5:8	3	ø	+	-		90	

+ = Morbidity

ø = Intubation plus oxygen

c = Control

6. Resuscitation in relation to neonatal behaviour and social maturity.

This study (Craven) has revealed some interesting trends in the methods of resuscitation adopted.

The Apgar scoring system has indicated that when the score is "poor", i.e. 5 and below, the administration of intranasal oxygen may not be the most efficient method of resuscitation, even though it may at first appear to be so.

Inspection of Table 5 shows the persistence of morbidity during the entire neonatal period when intranasal oxygen was used, and the subsequent impaired social maturity at 2 years of age.

Table 6 summarised some of the "results" when intubation plus oxygen was the method used. It is difficult to make comparisons between the two "results" as there are differences in the obstetrical factors in the two tables.

It is suggested however, (as the result of this study) that when the condition of the baby is "poor" and there is a history of obstetrical complications, intubation should be performed without undue delay, there may then be less morbidity in the neonatal period and a high social competence at 2 years of age.

Davis and Tizard (1961) refer to this "problem" of resuscitation.

TABLE 7

AGE, PARITY AND GESTATION

		OVERALL HOSPITAL DELIVERIES			ANTE PARTUM HAEMORRHAGE		
		A%	NA%	Total %	A%	NA%	Total %
AGE (Years)	Under 17 Over 42	6.7	3.3	5.4	3.0	5.1	3.7
	18 to 30	71.0	78.3	73.9	76.1	74.6	75.6
	31 to 42	22.2	18.4	20.7	20.9	20.3	20.7
PARITY	1	24.7	30.0	26.8	23.1	20.3	22.3
	2, 3, 4	54.2	59.9	56.4	47.8	66.1	55.4
	5 and over	21.1	10.1	16.8	29.1	13.6	24.4
GESTATION (Weeks)	Under 32 over 42	8.9	7.0	8.2	8.2	3.4	6.7
	33 to 36	5.1	4.0	4.7	14.2	23.7	17.1
	37 to 42	86.0	89.0	87.2	77.6	72.9	76.2

Note: "A" represents "Australian"
"NA" represents "New Australian".

7. Patterns of pregnancy and ante partum haemorrhage in "Australian" and "New Australian" mothers. *

Table 7 shows the pattern of Age, Parity and Gestation in the overall hospital population in the years of study (1960-1962 inclusive), and in the "Ante Partum Haemorrhage" cases under study.

Age

Both groups have the maximum number of pregnancies in the age group 18-30 years. Australian mothers have more pregnancies in the under 17 and over 42 year age group. Both have more and a similar number of pregnancies in the 31-42 year age group.

Incidence of Ante Partum Haemorrhage

The peak incidence in both groups is during 18-30 years of age. The incidence in the under 17 and over 42 year age group is similar, the incidence in the 31-42 year age group is identical.

Parity

In the general hospital population there is a slightly higher incidence of "primiparity" in the "New Australian" mothers. The incidence of 2nd, 3rd and 4th pregnancies is similar in both groups. In the 5 and over group there are twice as many "Australian" mothers as there are "New Australian" mothers.

Ante Partum Haemorrhage and Parity

Ante Partum Haemorrhage occurs more frequently in the "grand multipara" in the "Australian" mother, compared with the "New Australian".

Gestation

In both groups the maximum number of pregnancies deliver at 37-42 weeks. The patterns in the under 32 and over 42 weeks are similar in both.

Ante Partum Haemorrhage and length of gestation

The majority of pregnancies associated with A.P.H. terminate at 37-42 weeks in both groups. In the 33-36 weeks, however, 23% of "New Australian" mothers deliver compared with 14% of "Australian". It is suggested that these trends are worth following in larger series and that the results be submitted to statistical analysis.

* See page 37.

PART VIII- THE STUDY OF INFANTS BORN AFTER "PLACENTA PRAEVIA"

The total incidence of Placenta Praevia in this Study is:- 0.5%.

Total deliveries in years of study	-	7525
Total cases of Placenta Praevia	-	38
Still births	-	0
Neonatal deaths	-	3
Surviving babies	-	35

The study of these 35 babies is summarised as follows:-

Normal deliveries	-	6
Deliveries by Caesarian Section	-	29

Normal Deliveries

60/10, 60/40, 62/59, 62/8, 60/38, 61/10.

The progress of these babies was normal at all times.

SQ. ? , 120 , 100 , 100, 98, 96 (respectively).

Deliveries by Caesarian Section

Expectant Treatment	-	13
Immediate Treatment	-	16

All these deliveries occurred after the 36th week, except in 1 case (61/81 = see next page).

TABLE 8

EXPECTANT TREATMENT PLACENTA PRAEVIA

No.	APH Episodes/ Weeks	Time of Delivery Weeks	Type	Apgar	Neonatal Morbidity	6 Wks. Exam.	Social Quotient
APH Under 5 ozs.							
60/41	30	40	2	8			100
60/41c	-						100c
62/47	34	38	4	9			120
62/47c	-						100c
62/73	34	39	2	9			100
62/73c	-						100c
61/2	38	39	2	9		?	?
61/2c	-					?	?
61/1	36	39	3	9			100
61/1c	-						100c
62/30	39	39	1	9	R.D.S.		96
62/30c	-						100c
APH 5 - 20 ozs.							
61/40	39	39FD	2	6			100
61/40c	-						95c
62/46	34	38	4	9			96
62/46c	-						100c
62/70	30	38	3	10			100
62/70c	-						100c
60/14	35	38	4	3	R.D.S.	+	70
60/14c	-						100c
APH + 20 ozs.							
61/49	39	39	4	6			90
61/49c	-						100c
62/56	30	35	4	4			80
62/56c	-						100c
61/81	28	34	4	3	R.D.S.	?	25
61/81c	-						95c

F.D. = Severe Foetal Distress

R.D.S. = Respiratory Distress Syndrome

c = Control

\+ = Morbidity

Expectant Treatment

A.P.H. less than 5 ozs.

Babies over 6½ lbs. at birth

60/41) - Good Apgar scores. 100
62/47) - No difficulties in SQ. 120
62/73) - the neonatal period. 100

Babies 3½-6½ lbs. at birth

61/2 - did not attend the examinations.

61/1 - normal at all times. SQ. 100

62/30 - Respiratory Distress Syndrome in the neonatal period, subsequent progress good. SQ. 96

A.P.H. 5-20 ozs.

61/40) 100
62/46) - progress good at all SQ. 96
62/70) times 100

60/14 - 1st haemorrhage at 35 weeks, condition at birth poor. Apgar (3). Baby developed Respiratory Distress Syndrome. Hypertonic at 6 weeks. SQ. 70

A.P.H. 20 ozs. and over

61/49 - Apgar (6). SQ. 90

62/56 - Apgar (4). SQ. 80

61/81 - 1st haemorrhage at 28 weeks, 2nd at 34 weeks (admitted to hospital). Apgar (3). Baby developed Respiratory Distress Syndrome. Did not attend post natal Clinic. Gross mental retardation at 2 years. SQ. 25

Controls

The controls for all the above babies were normal at all times. The Social Quotients ranged from 95 - 100.

TABLE 9

"IMMEDIATE" TREATMENT PLACENTA PRAEVIA

No.	APH Episodes/ Weeks	Time of Delivery Weeks	Type	Apgar	Neonatal Morbidity	6 Wks. Exam.	Social Quotient
APH Under 5 ozs.							
60/48	38	38	2	8			95
60/48c	-						100c
61/36	37	37	3	10	+	+	75
61/36c	-						100c
62/36	33	33	4	8	+	?	90
62/36c	-						100c
APH 5 - 20 ozs.							
61/5	36	36	1	5	+	+	85
61/5c	-						100c
61/4	42	42	2	5	+	+	90
61/4c	-						?
61/35	36	36	3	7	+		90
61/35c	-						100c
60/30	32 + 35	35	2	5	R.D.S.	+	70
60/30c	-						100c
62/23	39	39	4	5			90
62/23c	-						100c
62/67	34*+ 38	38	2	2			95
62/67c	-						?
61/7	38	38FD	2	5	R.D.S.	+	75
61/7c	-						100c
61/74	34	34FD	2	5	R.D.S.		75
61/74c	-						90c
APH + 20 ozs.							
61/26	37	37	4	5			95
61/26c							?
62/33	39	39	4	5			100
62/33c	-						100c
61/51	39	39	4	3	+	+	75
61/51c	-						120c
60/82 (3 lbs.)	32	32	4	4	R.D.S.	+	50 Sp:
60/82	-						95c
61/76	36*+ 38	38	4	5	R.D.S.	+	55 Sp:
61/76c	-						100c

* = Treated at home by General Practitioner

F.D. = Severe Foetal Distress

R.D.S. = Respiratory Distress Syndrome

\+ = Morbidity

c = Control

Sp: = Spasticity

Immediate Treatment

A.P.H. less than 5 ozs.

60/48 - Apgar (8). SQ. 95

61/36 - Apgar (10). CNS AND R.S. difficulties 4 days after birth. Weight gain unsatisfactory, and hypertonic at 6 weeks. SQ. 75

62/36 - Apgar (8). R.S. difficulties 4 days after birth. ? Congenital heart lesion. SQ. 90

A.P.H. 5-20 ozs.

4 SQ's (85-95)

2 SQ's (70-75)

60/30 - 1st haemorrhage at home (32 weeks), no medical care. 2nd haemorrhage 35 weeks, admitted to hospital. SQ. 70
Apgar (3). Baby developed Respiratory Distress Syndrome

61/7 - Apgar (5). Baby developed Respiratory Distress Syndrome SQ. 75

61/74 - Apgar (5). Baby developed Respiratory Distress Syndrome SQ. 75

A.P.H. 20 ozs. and over - Total 5 (3 with birth weight over 6½ lbs.)

60/82 - Birth weight (3 lbs.). Haemorrhage at 32 weeks. Apgar (4) Respiratory Distress Syndrome SQ. 50. Spasticity

61/76 - Birth weight (6 lbs. 5 ozs.) Haemorrhage at 38 weeks. Apgar (5). Respiratory Distress Syndrome SQ. 55. Spasticity

Controls

The controls for all the above babies were normal at all times, (except for 2 cases*) i.e. the Social Quotients ranged from 100-120.

*61/74C - Birth weight (4½ lbs.) SQ. 90

60/82C - Birth weight (3½ lbs.) SQ. 95

Comments

Because of the small numbers involved, the trends indicated in this Study should be followed in a larger series of cases and submitted for statistical analysis.

Expectant Treatment

When the Ante Partum bleeding was slight the foetal results were good, they were also good when the bleeding was 5-20 ozs., except in one case 60/14 when the pregnancy was allowed to extend beyond the 36th week (the Placenta Praevia being Type 4). The birth weight of the baby was 5½ lbs. and the condition poor at birth. Resuscitation was by intubation, the baby developed a Respiratory Distress Syndrome and there were signs of cerebral irritability for 4 days. Hypertonia was noted at 6 weeks of age. The SQ. was 70 at 2 years. It is interesting to assess the outcome of this baby with the recommendations of Macafee et al. (1962) who stated that after the 36th week expectant treatment is not so essential... indeed unwise...

When the bleeding was 20 ozs. or more (Placenta Praevia Type 4 in all cases) the results were not good. 61/49 - SQ. 90, 62/56 - SQ. 80, 61/81 - SQ. 25. It is unlikely, however, that the gross mental retardation in the last case was due to Placenta Praevia.

Immediate Treatment

These results show generally disappointing conditions at 2 years of age. A high incidence of Respiratory Distress Syndrome in the 5-20 oz. A.P.H. group was noted and also Foetal Distress in 2 cases. The large "haemorrhages" were followed by poor neonatal histories and spasticity in 2 babies at 2 years.(60/82, 61/76) The latter was an unbooked patient. Macafee et al. (1962) also refer to the prognosis of booked and unbooked cases of Placenta Praevia.

PART IX - FURTHER COMMENTS

1. The Respiratory Distress Syndrome

In this study a diagnosis of the respiratory distress syndrome was made when there was an expiratory grunt and a resting respiratory rate over 60 per minute, between 1 and 30 hours of age.

In the Accidental Haemorrhage group, the respiratory distress occurred in 6 of the 9 neonatal deaths, and in 12 of the 193 surviving babies.

In the Placenta Praevia group, it occurred in 3 of the 3 neonatal deaths and in 8 of the 35 surviving babies.

This study suggests that the incidence of the respiratory distress syndrome is lower in association with accidental haemorrhage than with placenta praevia. In the Accidental Haemorrhage group spasticity at 2 years occurred in 2 children, and hemiplegia in 1 child, who had suffered from the respiratory distress syndrome during the neonatal period.

In the Placenta Praevia group, the respiratory distress syndrome occurred less frequently in the babies delivered by "expectant caesarian section", than by "immediate caesarian section" (see pages 91 and 92). The babies affected by the respiratory distress syndrome were of low birth weight in both groups and showed an impaired social competence at 2 years of age.

Much has been written on the subject of the respiratory distress syndrome in recent years — Rogers et al (1956) and Cohen et al (1960) referred to its association with a history of bleeding in pregnancy. Ambrus et al (1963) referred to its association with caesarian section. Miller (1963) reported the fatality rates of this syndrome in relation to birth weight and Ringrose et al (1960) described it as "the biggest hazard confronting the foetus making the transition to the healthy baby".

2. Behaviour Problems

It would appear from this Study (Craven) that Ante Partum Haemorrhage, whether "Accidental" or from Placenta Praevia, is associated with subsequent behaviour difficulties, particularly relating to sleeping and talking.

It is interesting to note that sleeping difficulties are more closely associated with the smaller haemorrhages, and slowness in talking with the larger haemorrhages. The association of both, with more than one episode of bleeding, is also suggested in this Study.

The incidence of behaviour difficulties in the "controls" was very low.

The Very Small Babies

There were no sleeping difficulties (except in one control) in these babies, but slowness in talking appeared in 3 of the Accidental Haemorrhage babies in this group and in a similar number of "controls".

The Placenta Praevia Babies

Slowness in talking appeared in 15 of the 33 babies. Sleep disturbance occurred in only 1 baby (a "control").

There were no problems in the 6 cases who were delivered normally, but there were behaviour problems and slowness in talking in 15 of the 29 delivered by Caesarian Section.

The association between Behaviour Disorders and Maternal Factors was quoted by Rogers (1955). Pasmanick et al. (1956), and Drillien (1964) have also shown that a history of complications during pregnancy and delivery may be associated with subsequent behaviour disorder, irrespective of socio-economic status.

3. Congenital Malformations and Ante Partum Haemorrhage

The overall incidence of congenital malformations in the Queen Elizabeth Hospital (1960, 1961, 1962) - the years of the present Study (Craven) was 2.7%.

In the "Accidental Haemorrhage" group of babies the incidence was 3.6%.

The congenital malformations were:-

2 Still Births - One deformity of the skull (extreme exycephaly), and one anencephaly.

1 Neonatal Death- Primary renal agenesis.

3 Surviving - All of which were diagnosed as Congenital Heart lesions of a mild degree (probably inter ventricular septal defect).

In the Placenta Praevia group of babies, the incidence was 5.3%.

2 Neonatal Deaths:-

1 Hare lip and cleft palate (birth weight 3½ lbs.)

1 Congenital Heart lesion (autopsy refused).

The incidence of congenital malformations in Ante Partum Haemorrhage has been reported by many authors - Davis and Campbell (1946), Pealman and Hunt (1949) and Westgren (1954), who referred to the incidence in Placenta Praevia. Hibbard (1963) referred to the incidence of congenital anomalies in Abruptio Placentae.

PART X - CONCLUSIONS

Current interest in behaviour disorders in childhood associated with brain damage is attested by the growing medical literature on the subject. In non medical circles too, parents, teachers and social workers have become very much aware of the "Brain Injured Child".

One of the most persistent questions asked of those involved in Child Care, is, "Do you think my child is developing normally?".

Physically (weight and height) this is not hard to answer, with the aid of graphs etc. - but more often the parents are inquiring about mental development.

When this Study began, the results of research relating perinatal conditions and later development of the infant were conflicting:-

There were two schools of thought - those which stated that factors such as foetal distress, anoxia, cerebral irritation in the newborn were followed by neurological and other abnormal sequelae, and those which stated this was not so. There were many conflicting reports dealing not only with the assessment of morbidity in the newborn but also of the predictive value of such findings. There were differences of opinion relating to the management of the newborn and its future effects on the infant.

Ante Partum Haemorrhage and its effect on the survival of the infant at birth were well documented, but there were few references to such babies after this.

In retrospective and prospective studies of infants born after "complications of pregnancy", some evidence was accumulating to show that the baby born after an Ante Partum Haemorrhage might be subject to congenital malformations and abnormal neurological conditions such as cerebral palsy, epilepsy and mental retardation.

A study of "Ante Natal Haemorrhage and Toxaemias of Pregnancy and the Development of certain Neuropsychiatric Disorders" began in Columbus, Ohio in 1958 under the direction of Professor Hilda Knobloch and Dr. Ralph Patterson.

In a personal communication from Professor Knobloch (1963) she stated, referring to the above:-

"For a variety of reasons we were unable to continue this study".

It follows that, to the best of my belief, this (Craven's) is the first study whose specific aims are to study the babies born to mothers who suffered Ante Partum Haemorrhage after the 28th week of pregnancy and to correlate their neonatal condition, their development, social competence and varying degrees of haemorrhage.

THE RESULTS

Perhaps the most outstanding and original contributions have been to show that ANTE PARTUM HAEMORRHAGE:-

CAN ENDANGER THE LIFE OF THE FOETUS.

CAN ADVERSELY AFFECT THE CONDITION OF THE INFANT AT BIRTH.

CAN ADVERSELY AFFECT THE SOCIAL MATURITY OF THE CHILD AT 2 YEARS OF AGE.

Condition of the baby at birth and Social Maturity at 2 years of age

There is a statistically significant relationship between the condition of the baby at birth (as judged by the Apgar Score) and Social Maturity at 2 years of age. When Foetal Distress is considered in association with the Apgar Score, and together they are related to Social Competence at 2 years - the relationship is even more statistically significant.

This Study has indicated that a history of Foetal Distress, plus a low Apgar Score at birth, will be followed by difficulties of respiration and cerebral irritability during the first 24 hours of life. This relationship is of statistical significance.

There is some evidence that the resuscitation management in these cases must be improved - in other words Intubation should be carried out more readily in future when the Apgar Score at birth is considered to be "poor".

There is a statistically significant relationship between birth weight and Social Competence at 2 years of age.

When birth weight and Ante Partum Haemorrhage are considered together and correlated with diminished Social Competence at 2 years of age, the relationship is statistically significant.

Behaviour in the Neonatal Period and its relation to Social Maturity at 2 years of age

Signs of irritability in the Central Nervous System and Respiratory Distress in the first 24 hours after birth are related to impaired Social Maturity at 2 years of age.

Abnormalities of the Central Nervous System which are present on the 4th day of life, and on the day of discharge of the baby from hospital, are related to diminished Social Competence at 2 years of age. These relationships are statistically significant.

The Post Natal Examination (at 6 weeks of age)

This Study indicates that examination of the neurological system and history of feeding habits at this time can reveal early signs of "Cerebral Damage", and predict impaired Social Competence at 2 years of age.

Height and Weight

This Study indicates that the height and weight of babies whose mothers have suffered an Ante Partum Haemorrhage, is below that of babies whose mothers do not give a history of bleeding late in pregnancy. These findings are statistically significant.

Further results which are considered to advance medical knowledge

The following results have not been submitted for statistical analysis, but show trends which suggest further research in the understanding of the perinatal period, its management and long term effects on the development of the child.

Episodes of Ante Partum Haemorrhage and Social Maturity

This Study has shown an impaired Social Maturity at 2 years of age in children born after pregnancies where there was a history of 2 or more episodes of bleeding after the 28th week.

Resuscitation

Every effort should be made to establish efficient respiration on the part of the baby without delay. This is particularly important when; the Ante Partum Haemorrhage is large (20 ozs. or more), when there is a history of more than one episode of Ante Partum bleeding, when there is an associated "complication" such as grand multiparity or a pregnancy when there has been no ante natal care. All members of the "team" involved in the "delivery" following an Ante Partum Haemorrhage should be trained in the techniques of intubation and modern methods of assessment and management, as it is suggested in this Study that the neonatal behaviour and subsequent development depends on this.

Placenta Praevia

This Study supports the view that "Expectant Treatment is of paramount importance in the management of Placenta Praevia, and that delay after the 38th week of gestation yields disappointing results. large haemorrhages are followed by an increased incidence of neonatal morbidity in both types of treatment.

The Respiratory Distress Syndrome

This Study has disclosed a higher incidence of the Respiratory Distress Syndrome in the "Placenta Praevia" babies as compared with the "Accidental Haemorrhage" babies, and that all the affected babies were of low birth weight. The Respiratory Distress Syndrome occurred in only one "control" baby (whose birth weight was under 5½ lbs.). This Study therefore suggests that the Respiratory Distress Syndrome is not due to the Caesarian Section, but is related to the obstetrical complication for which the Caesarian Section was indicated, and in particular Placenta Praevia.
This is a most interesting observation warranting further research.

Convulsions

There were no instances of convulsions in the neonatal period in any babies in this Study, nor in the later examinations in the Placenta Praevia group.

In the Accidental Haemorrhage group:- convulsions in childhood were associated with a history in the mother of large amounts of Ante Partum Haemorrhage, grand multiparity, and the absence of ante natal care; in the baby with a low birth weight, a poor condition at birth, a high neonatal morbidity, and diminished Social Maturity at 2 years of age. This Study supports the view that convulsions are a "continuum of reproductive wastage".

Hemiplegia

Hemiplegia occurred in 2 babies in the Accidental Haemorrhage group. In both cases, the Moro response was absent on the affected side on the 4th day of life, and diminished movements were recorded on the affected side at the post natal visit (6 weeks of age). This is believed to be an original observation.

Spasticity

Spasticity occurred in the Accidental Haemorrhage and in the Placenta Praevia group of babies. In both it was associated with 2 or more episodes of bleeding which was more than 20 cms. in amount. Abnormalities of muscle tone were noted on the 4th day of life and confirmed at the post natal visit. In all instances the babies were of low birth weight. Spasticity at 2 years was associated with diminished Social Competence.

Behaviour Problems

This Study supports the views of other authors that behaviour problems are associated with complications of pregnancy, i.e. they are a "continuum of reproductive wastage". It is further suggested that delayed talking is associated with the larger Ante Partum Haemorrhages, and in particular 2 episodes of bleeding, and sleeping problems with the smaller haemorrhages.

Congenital Malformations

This Study supports the views of other authors that there is an increased incidence of congenital malformations in association with Ante Partum Haemorrhage as compared with the overall hospital population of births.

Social Maturity

This Study has indicated that the Vineland Social Maturity Scale is a suitable scale for assessing social progress of the individual in a prospective study. To the best of my belief and certainly to that of the author (personal communication from Doll.). This is the first time that this "scale" has been used in a prospective study bearing this title.

A further study of these babies at a later age would be a valuable contribution to medical knowledge.

It may be suggested that the PLAN adopted in this Study (which was devised by Craven) would be suitable as a basis of planning for any "Prospective Study of Infants".

DECLARATION OF ORIGINALITY

I wish to state that this work is entirely original and that I planned this survey and personally interviewed each mother and carried out the examination of every infant at the times specified.

The system of recording of the findings and the composition of the Thesis is entirely my own.

Indications have been made in the appropriate places where the work is thought to advance medical knowledge.

This Thesis contains no material which has been accepted for the award of any other degree or diploma in any university, and to the best of my knowledge and belief this Thesis contains no material previously published or written by another person except when due reference is made in the text.

Dilys M. Craven

PART XI - SUMMARY

Part I - The Introduction

This indicates that the knowledge of the perinatal events is far from complete, and that accurate and statistically valid answers to many questions about this period would be a tremendous boon to medicine.

Part II - The Historical Survey

This has revealed that the Study of Infants has aroused the curiosity of medical men for over 2,000 years. That even at the earliest times it was considered that conditions which occurred "around the birth" (now called the perinatal period) had some relation to the health and development of the individual.

Ante Partum Haemorrhage too, was described by the physicians of Ancient Greece: that the first classification into Accidental Haemorrhage and Placenta Praevia occurred in England towards the end of the 18th Century. The great danger which it incurred, both to the mother and the baby, was reflected in the high Maternal and Infant Mortality Rates even at the beginning of the 20th Century.

The concept of permanent cerebral damage being related to birth trauma since the time of Little (1861) has in the past decade been challenged; that cerebral palsy and other neurological disturbances might result from the complications of pregnancy and perinatal conditions has now been put forward.

The views of contemporary writers on perinatal conditions and later development are quoted in the final section of the Historical Survey.

Part III - The Research Plan

- The Method of Procedure

These are both described in this section, together with Notes on Special Examinations used in Study.

Part IV - A Study of Ante Partum Haemorrhage

The incidence of Ante Partum Haemorrhage and its component parts, the Perinatal Mortality, and the Attendances throughout the Study Period, are described in this section.

Part V - A Study of Infants - born after "Accidental Haemorrhage"

In this section have been tabulated the results of the Infant Studies - in groups depending on the amount of Haemorrhage, birth weight, and degree of Foetal Distress. The Apgar Score, method of resuscitation, neonatal behaviour, post natal examination, and the "2 year"examination, including the Social Quotient, are all recorded in this section. Each "A.P.H." baby being compared with its "control".

Part VI - Deductions, comments and statistical significance of Infant Studies in Accidental Haemorrhage

The above relating to Ante Partum Haemorrhage, neonatal and post natal condition, and Social Maturity, together with height and weight measurements, are recorded in this section.

Part VII - Further comments on Infant Studies in Accidental Haemorrhage

The above relating to perinatal mortality, neonatal morbidity, Social Maturity, convulsions, hemiplegia and spasticity, and methods of resuscitation, together with a note on the patterns of pregnancy and Ante Partum Haemorrhage in the mothers' study are to be found in this section.

Part VIII - The Study of Infants born after "Placenta Praevia"

The incidence, types of delivery and treatment of babies born after Placenta Praevia is the subject of this section. The numbers, however, were too small to be submitted for statistical analysis. The trends revealed are recommended to be followed in a larger series of cases.

Part IX - Further Comments -

relating to the Respiratory Distress Syndrome, Behaviour Problems and Congenital Malformations appear in this section.

Part X - Conclusion

Results which have been submitted for statistical analysis, and points indicating advances to medical knowledge, appear at the beginning of this section. These are followed by comments relating to special subjects and trends indicating lines of further research.

A "Declaration of Originality" concludes this Prospective Study.

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APPENDIX

APPENDIX Ia

CODE - Abbreviations used in Case Summaries (C = Control)

INFANT

Pr. = Premature

Birth Weight	under 3½ lbs.	- 1
	3½-6½ lbs.	- 2
	over 6½ lbs.	- 3
Ante Partum Haemorrhage	less than 5 ozs.	- 3
	5-20 ozs.	- 2
	over 20 ozs.	- 1
Foetal Distress	no F.D.	- 3
	moderate F.D.	- 2
	severe F.D.	- 1
Resuscitation	aspiration	- 3
	intra nasal oxygen	- 2
	intubation and oxygen	- 1
Apgar Score	- 0 - 5	- 1
	- 6 - 8	- 2
	- 9 - 10	- 3
Central Nervous System (C.N.S.)	normal	- 3
	mild disorder	- 2
	marked disorder	- 1
Respiratory System (R.S.)	normal	- 3
	mild disorder	- 2
	respiratory distress syndrome	- 1
General Condition (G.C.)	good	- 3
	fair	- 2
	poor	- 1
Social Quotient	- SQ	
Neonatal	first day	- 1
	fourth day	- 4
	day of discharge	- D

PREGNANCY

Mother's Age (in years)	18-30	- 3
	31-42	- 2
	under 17, over 42	- 1
Parity	2, 3, 4	- 3
	1	- 2
	5 and over	- 1
Gestation (in weeks)	37-42	- 3
	33-36	- 2
	under 32, over 42	- 1
Delivery	normal	- N
	forceps	- F
	breech	- Br.
	caesarian section	- C.S.
Episodes of Bleeding	one	- +
	two	- ++
Toxaemia	- T	
Hypertension	- H	
Australian	- A	
New Australian	- NA	

Height	*36" and over	- 3
	31-35"	- 2
	under 31"	- 1
Weight (Boys)	*35 lbs. and over	- 3
	25-34 lbs.	- 2
	under 25 lbs.	- 1
(Girls)	*31 lbs. and over	- 3
	24-30 lbs.	- 2
	under 24 lbs.	- 1

* Denotes average standards for Australian children (see ref.110).

APPENDIX I

Pregnancy									Neo-Natal														6 Week Exam'n		2 Year Examination								
Toxaemia/ Hypertension	No. of Episodes	Past Pregnancies	Gestation	Parity	Age	Case No.	Thesis No.	A/NA	Delivery	Sex	Birth Weight	A.P.H.	F.D.	Resuscitation	Apgar	C.N.S.	R.S.	C.N.S.	R.S.	C.N.S.	R.S.	G.C.	C.N.S.	Weight	Height	Milestones	C.N.S.	Feeding	Sleeping	Talking	Behaviour	S.Q.
	+	3N	1	3	2	8407	60/26	A	N.D.	M	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
		3N	1	3	2	8228	60/26C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	1N	3	3	3	6171	60/34	A	N.D.	F	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
		1N	3	3	3	8766	60/34C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?
	+	3N	3	1	2	8924	60/36	A	N.D.	F	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
		4N	3	1	2	1617	60/36C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
	+		3	2	3	8815	60/55	NA	N.D.	M	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
			3	2	3	9027	60/55C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
	+	4N	3	1	3	3379	60/57	A	N.D.	F	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	3	96
		4N	3	1	3	9710	60/57C				3	-	3	3	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?	?
	+	6N	3	1	3	3825	60/59	NA	N.D.	M	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	110
		6N	3	1	3	2063	60/59C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	1N	3	3	3	9671	60/65	NA	N.D.	M	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
		1N	3	3	3	9343	60/65C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	6N	3	1	2	921	60/56	A	N.D.	M	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
		6N	3	1	2	2854	60/56C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	1F	3	3	3	4922	60/8	A	N.D.	M	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	3	2	96
		2N	3	3	3	5424	60/8C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	1N	3	3	3	357	60/25	A	N.D.	M	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
		1N	3	3	3	5910	60/25C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	1N	3	3	3	9358	60/70	NA	N.D.	M	3	3	3	3	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?	?
		1N	3	3	3	6523	60/70C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+		3	2	2	9361	60/78	A	F	M	3	3	3	2	1	2	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	96
			3	2	2	9005	60/78C				3	-	3	2	1	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+		3	2	3	9025	60/62	A	F	M	3	3	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	110
			3	2	3	5775	60/62C				3	-	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	2N	3	3	3	11634	61/68	A	F	M	3	3	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
		2N	3	3	3	9694	61/68C				3	-	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+		3	2	3	9907	61/15	NA	F	F	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	96
			3	2	3	9812	61/15C				3	-	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
	+	1N	3	3	3	*8533	60/33	NA	C.S.	F	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	110
		1CS	3	3	3	4130	60/33C				3	-	3	3	3	3	3	3	3	3	3	3	3	?	?	3	3	3	3	3	3	3	3	100
	+	1Pr.	3	3	2	7796	61/42	A	C.S.	F	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	110
		1CS	3	3	2	10783	61/42				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	96

APPENDIX II

Pregnancy								Neo-Natal												6 Week Exam'n		2 Year Examination								
Toxaemia/ Hypertension	No. of Episodes Past Pregnancies		Gestation	Parity	Age	Case No.	Thesis No.	A/NA	Delivery	Sex	Birth Weight	A.P.H.	F.D.	Resuscitation	Apgar	C.N.S.	R.S.	C.N.S.	R.S.	C.N.S.	R.S.	G.C.	C.N.S.	Weight	Height	Milestones	C.N.S.	Feeding	Sleeping	Talking	Behaviour	S.Q.
+	1N		3	3	3	4643	60/64	NA	N.D.	M	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	2N		3	3	3	9513	60/64C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
+	5N		3	1	3	2558	60/61	A	N.D.	M	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	110
	4N		3	1	3	7395	60/61C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	110
+	1N		3	3	2	8329	60/75	A	N.D.	M	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	110
	2N		3	3	2	4609	60/75C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
+	5N		3	1	3	8924	60/53	A	N.D.	F	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	4N		3	1	3	1163	60/53C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
+	2N		3	3	3	8566	60/47	NA	N.D.	M	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	110
	2N		3	3	3	5869	60/47C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	110
+	1N		3	3	2	8626	60/24	A	N.D.	M	3	3	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?
	1N		3	3	2	8230	60/24C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	100
++	1Pr.		3	3	2	9247	60/67	NA	N.D.	F	3	3	3	3	3	2	3	2	3	3	3	3	3	3	3	3	3	3	2	3	96
	1N		3	3	2	7125	60/67C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
+			3	2	2	8329	60/46	A	N.D.	F	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
			3	2	2	9105	60/46C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
+	1N		3	3	2	8246	60/31	A	N.D.	M	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
	1Tw.		3	3	2	8100	60/31C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
+	2N		3	3	3	8805	60/60	A	N.D.	M	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
	2N		3	3	3	6923	60/60C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
++	3N		3	3	3	*6215	60/39	A	N.D.	M	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	96
	2N		3	3	3	4060	60/39C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
+	2N		3	3	3	10013	61/22	NA	N.D.	M	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	110
	2N		3	3	3	6309	61/22C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
++	6N		3	1	2	10641	61/20	A	N.D.	M	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	95
	5N		3	1	2	2371	61/20C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?
+	4N		3	1	3	89	61/34	A	N.D.	M	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
	4N		3	1	3	1460	61/34C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	120
+	2N		3	3	3	10554	61/32	NA	N.D.	F	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	2N		3	3	3	3994	61/32C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
+	4N		3	1	2	11074	61/73	NA	N.D.	F	3	3	3	3	3	3	3	3	3	3	3	?	?	3	3	3	3	3	3	3	100
	4N		3	1	2	11111	61/73C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
+	1N		3	3	3	10768	61/52	A	N.D.	F	3	3	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?
	2N		3	3	3	3340	61/52C				3	-	3	3	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?

APPENDIX III

Toxaemia/ Hypertension	No. of Episodes Past	Pregnancies	Gestation	Parity	Age	Case No.	Thesis No.	A/NA	Delivery	Sex	Birth Weight	A.F.H.	F.D.	Resuscitation	Apgar	C.N.S. 1	R.S. 1	C.N.S. 5	R.S. 5	C.N.S. 10	R.S. 10	6 Week Exam'n G.C.	6 Week Exam'n C.N.S.	2 Year Examination Weight	Height	Milestones	C.N.S.	Feeding	Sleeping	Talking	Behaviour	S.Q.
+	4N	3	1	3	11376	61/84	A	N.D.	F	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	120
	4N	3	1	3	3345	61/84C					3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	96
+	2N	3	3	3	6375	61/38	A	N.D.	F	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	2N	3	3	3	10550	61/38C					3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
+	2N	3	3	3	7199	61/83	A	N.D.	F	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	2N	3	3	3	4914	61/83C					3	-	3	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?	?
+	5N	3	1	2	2338	62/10	A	N.D.	F	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
	5N	3	1	2	6949	62/10C					3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
+	6N	3	1	2	12250	62/29	A	N.D.	M	3	3	3	2	2	3	2	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?
	6N	3	1	2	10224	62/29C					3	-	3	3	3	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?
++		3	2	3	12121	62/41	A	N.D.	F	3	3	3	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?	?
		3	2	3	11850	62/41C					3	-	3	3	3	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?
+	4N	3	1	3	11922	62/32	A	N.D.	F	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	3	3	2	3	2	2	96
	4N	3	1	3	12099	62/32C					3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
+	4N	3	1	2	1623	62/37	A	N.D.	F	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	4N	3	1	2	5941	62/37C					3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
+	2N	3	3	3	2876	62/64	A	N.D.	M	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	2N	3	3	3	13450	62/64C					3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	100
+	4N	3	1	3	8789	62/51	A	N.D.	F	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	4N	3	1	3	11847	62/51C					3	-	3	3	3	3	3	3	3	3	3	3	?	?	3	3	3	3	3	3	3	3	100
+	4N	3	1	3	2863	62/50	A	N.D.	M	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	5N	3	1	3	10114	62/50C					3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
+	2N	3	3	3	12908	62/62	A	N.D.	M	3	3	3	3	3	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?
	2N	3	3	3	6115	62/62C					3	-	3	3	3	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?
+	4N	1	1	3	13019	62/73	A	N.D.	M	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
	4N	1	1	3	12412	62/73C					3	-	3	3	3	3	3	3	3	3	3	3	?	?	3	3	3	3	3	3	3	3	120
+	5N	3	1	3	555	62/17	A	N.D.	M	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
	4N	3	1	3	5086	62/17C					3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
+	1N	3	3	3	9177	62/11	A	N.D.	M	3	3	3	2	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	1N	3	3	3	5469	62/11C					3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
+	2N	3	3	3	6442	62/13	A	N.D.	M	3	3	3	3	3	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?
	2N	3	3	3	8947	62/13C					3	-	3	3	3	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?
+	1N	3	3	3	7782	62/4	A	N.D.	M	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
	1N	3	3	3	11984	62/4C					3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100

APPENDIX IV

Pregnancy									Neo-Natal														6 Week Exam'n		2 Year Examination								
Toxaemia/ Hypertension	No. of Episodes Past Pregnancies		Gestation	Parity	Age	Case No.	Thesis No.	A/NA	Delivery	Sex	Birth Weight	A.P.H.	F.D.	Resuscitation	Apgar	I C.N.S.	I R.S.	A C.N.S.	A R.S.	D C.N.S.	D R.S.		C.C.	C.N.S.	Weight	Height	Milestones	C.N.S.	Feeding	Sleeping	Talking	Behaviour	S.Q.
	+	2N	3	3	2	4874	60/23	A	N.D.	M	3	3	2	2	1	2	2	2	2	2	3		3	2	3	3	2	3	2	2	2	2	82
		3N	3	3	2	5491	60/23C				3	-	2	2	1	2	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	100
	+	1N	3	3	3	3478	60/9	A	N.D.	M	3	3	2	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	110
		1N	3	3	3	7607	60/9C				3	-	2	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	100
	+	1N	3	3	3	4566	60/61	A	N.D.	F	3	3	2	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	100
		1N	3	3	3	8358	61/61C				3	-	2	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	120
	+	1N	3	3	2	11281	61/72	NA	N.D.	M	3	3	2	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	100
		1N	3	3	2	11355	61/72C				3	-	2	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	100
	+		3	2	3	11501	61/85	A	N.D.	M	3	3	2	2	2	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	100
			3	2	3	10970	61/85C				3	-	2	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	100
	+	1N	3	3	3	11128	61/65	NA	N.D.	F	3	3	2	3	3	3	3	3	3	3	3		3	3	?	?	?	?	?	?	?	?	?
		1N	3	3	3	11242	61/65C				3	-	2	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	120
	+	1N	3	3	3	4529	61/54	A	N.D.	F	3	3	2	3	3	3	3	3	3	3	3		?	?	3	3	3	3	3	3	3	3	100
		1N	3	3	3	10762	61/54C				3	-	2	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	100
	+		3	2	3	11742	62/19	A	N.D.	M	3	3	2	3	3	3	3	2	2	3	3		3	3	3	3	3	3	3	3	3	3	100
			3	2	3	11803	62/19C				3	-	2	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	100
	+	1M/C	3	3	3	9143	60/80	A	F	M	3	3	2	2	2	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	100
		1N	3	3	3	2367	60/80C				3	-	2	2	2	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	100
	+	1Pr.	2	3	2	8098	60/37	NA	F	M	3	3	2	2	2	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	120
		1Pr.	2	3	2	9066	60/37C				3	-	2	2	2	3	3	3	3	3	3		?	?	3	3	3	3	3	3	3	3	120
	+	3Pr.	3	3	2	3216	60/35	A	F	M	3	3	2	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	100
		2N	3	3	2	503	60/35C				3	-	2	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	100
	+		3	2	3	*10586	60/84	A	F	F	3	3	2	2	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	100
			3	2	3	10773	60/84C				3	-	2	2	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	100
	+		3	2	2	10723	61/60	A	F	F	3	3	2	2	2	2	2	2	3	3	3		3	3	3	3	3	3	2	3	3	3	95
			3	2	2	10770	61/60C				3	-	2	2	2	2	2	3	3	3	3		3	3	3	3	3	3	3	3	3	3	100
	+	1F	3	3	2	3311	61/31	A	F	M	3	3	2	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	100
		2N	3	3	2	9982	61/31C				3	-	2	3	3	3	3	3	3	3	3		3	3	?	?	?	?	?	?	?	?	?
	+	2N	3	3	3	9956	61/24	A	F	M	3	3	2	2	2	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	120
		2N	3	3	3	10165	61/24C				3	-	2	2	2	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	120
	+	1N	2	3	3	13306	62/61	A	F	M	3	3	2	2	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	100
		1N	2	3	3	12001	62/61C				3	-	2	2	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	100
	+	1N	1	3	3	13107	62/76	A	F	F	3	3	2	3	3	3	3	3	3	3	3		?	?	3	3	3	3	3	3	3	3	100
		1N	3	3	3	12819	62/76C				3	-	2	3	3	3	3	3	3	3	3		?	?	3	3	3	3	3	3	3	3	100

APPENDIX V

Pregnancy									Neo-Natal														6 Week Exam'n		2 Year Examination								
Toxaemia/ Hypertension	No. of Episodes	Past Pregnancies	Gestation	Parity	Age	Case No.	Thesis No.	A/NA	Delivery	Sex	Birth Weight	A.F.H.	F.D.	Resuscitation	Apgar	1 C.N.S.	1 R.S.	4 C.N.S.	4 R.S.	10 C.N.S.	10 R.S.		G.C.	C.N.S.	Weight	Height	Milestones	C.N.S.	Feeding	Sleeping	Talking	Behaviour	S.Q.
	+		3	2	2	10357	60/44	A	C.S.	M	3	3	2	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	100
			3	2	2	10437	60/44C				3	-	2	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	100
	+	1CS	3	3	3	7728	60/71	NA	C.S.	M	3	3	2	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	100
		1CS	3	3	3	7679	60/71C				3	-	2	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	100
	+		3	2	3	11520	62/22	A	C.S.	M	3	3	2	2	2	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	100
			3	2	3	12640	62/22C				3	-	2	2	2	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	110
	+		3	2	2	12526	62/16	A	C.S.	M	3	3	2	2	2	3	2	3	3	3	3		3	3	3	2	3	2	3	3	3	90
			3	2	2	12656	62/16C				3	-	2	2	2	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	100
	+	2F	3	3	3	9562	62/34	A	C.S.	F	3	3	2	3	3	3	3	3	3	3	3		3	3	?	?	?	?	?	?	?	?	?
		1CS	3	3	3	5284	62/34C				3	-	2	3	3	3	2	3	3	3	3		3	3	3	3	3	3	3	3	3	100
	+	1N	3	3	3	7597	60/6	A	N.D.	F	3	3	1	2	2	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	110
		1N	3	3	3	5873	60/6C				3	-	1	2	2	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	100
	+	2N	3	3	3	7733	60/1	NA	N.D.	F	3	3	1	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	100
		2N	3	3	3	2928	60/1C				3	-	1	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	120
	+	2N	3	3	2	9849	60/77	NA	N.D.	F	3	3	1	3	3	3	3	3	3	3	3		?	?	?	?	?	?	?	?	?	?
		2N	3	3	2	9704	60/77C				3	-	1	3	3	3	3	3	3	3	3		?	?	?	?	?	?	?	?	?	?
	++	2N	3	3	2	755	61/64	A	N.D.	F	3	3	1	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	100
		2N	3	3	2	1197	61/64C				3	-	1	3	3	3	3	3	3	3	3		?	?	3	3	3	3	3	3	3	100
	+		3	2	3	7566	61/62	A	N.D.	M	3	3	1	3	3	3	3	3	3	3	3		3	3	3	2	3	3	3	2	3	96
			3	2	3	11137	61/62C				3	-	1	3	3	3	3	3	3	3	3		3	3	3	2	3	3	3	3	3	100
	++		3	2	3	9920	61/17	NA	N.D.	F	3	3	1	3	2	3	3	3	3	3	3		3	3	3	3	2	3	3	2	2	3	90
			3	2	3	10024	61/17C				3	-	1	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	100
	++	2N	3	3	2	*3148	61/75	A	N.D.	F	3	3	1	2	1	3	2	2	3	3	3		2	2	3	3	2	3	3	2	2	3	85
		2N	3	3	2	6787	61/75C				3	-	1	2	2	3	2	3	3	3	3		3	3	?	?	?	?	?	?	?	?	?
	+	1N	3	3	3	12634	62/53	NA	N.D.	M	3	3	1	2	2	3	2	3	3	3	3		3	3	3	2	3	3	3	3	3	100
		2N	3	3	3	8314	62/53C				3	-	1	2	2	3	3	3	3	3	3		3	3	?	?	?	?	?	?	?	?	?
	+		2	2	2	1382	62/5	NA	N.D.	F	3	3	1	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	120
			2	2	2	1485	62/5C				3	-	1	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	100
	+		3	2	2	9772	62/74	NA	N.D.	F	3	3	1	3	3	3	3	3	3	5	3		2	3	3	2	2	2	2	3	2	100
			3	2	2	12993	62/74C				3	-	1	3	3	3	3	3	3	3	3		3	3	2	3	3	3	3	3	3	100
	+	1N	3	3	3	8553	62/24	A	F	M	3	3	1	2	2	3	3	3	3	3	3		?	?	?	?	?	?	?	?	?	?	?
		1N	3	3	3	12610	62/24C				3	-	1	2	2	3	3	3	3	3	3		3	3	?	?	?	?	?	?	?	?	?

APPENDIX VI

Pregnancy									Neo-Natal															6 Week Examn		2 Year Examination								
Toxaemia/ Hypertension	No. of Episodes	Past Pregnancies	Gestation	Parity	Age	Case No.	Thesis No.	A/NA	Delivery	Sex	Birth Weight	A.F.H.	F.D.	Resuscitation	Apgar	1 C.N.S.	1 R.S.	4 C.N.S.	4 R.S.	10 C.N.S.	10 R.S.	G.C.	C.N.S.	Height	Weight	Milestones	C.N.S.	Feeding	Sleeping	Talking	Behaviour	S.Q.
	+	1N	3	3	3	9294	60/43	A	N.D.	M	2Pr.	3	3	2	2	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	110
		1N	3	3	3	8386	60/43C				2	-	3	2	3	3	3	3	3	3	3	?	?	3	3	3	3	3	3	3	3	3	100
	+	1N	3	3	3	8865	60/42	A	N.D.	F	2Pr.	3	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?	?
		2N	3	3	3	4207	60/42C				2	-	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?	?	?
	++	5N	3	1	3	8685	60/49	A	N.D.	F	2Pr.	3	3	2	2	3	1	2	2	3	3	2	2	3	3	2	3	3	2	2	2	68
		5N	3	1	3	4253	60/49C				2	-	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	96
	++		3	2	3	11020	61/69	A	N.D.	M	2	3	3	3	2	3	2	3	2	3	3	2	3	2	2	3	3	2	2	2	2	75
			3	2	3	11880	61/69C				2	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	5N	3	1	2	11213	61/61	A	N.D.	F	2Pr.	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	120
		5N	3	1	2	11471	61/61C				2	-	3	3	3	3	3	3	3	3	3	?	?	3	2	3	3	3	3	3	3	3	100
	+	1N	3	3	3	2944	61/12	A	N.D.	M	2Pr.	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
		2N	3	3	3	10375	61/12C				2	-	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?	?	?
	+	2N	3	3	3	10793	61/46	A	N.D.	F	2Pr.	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
		2N	3	3	3	10972	61/46C				2	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	3N	3	3	3	8387	61/53	NA	N.D.	F	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
		3N	3	3	3	7895	61/53C				2	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
	+	5N	3	1	3	11664	61/67	A	N.D.	F	2	3	3	2	2	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	100
		4N	3	1	3	11280	61/67C				2	-	3	2	2	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	100
	+	2N	3	3	3	2784	62/21	A	N.D.	F	2Pr.	3	3	3	3	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?
		2N	3	3	3	7876	62/21C				2	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	3N	3	3	3	*13078	62/49	A	N.D.	M	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	100
		2N	3	3	3	8900	62/49C				2	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	1N	3	3	3	8945	62/75	NA	N.D.	F	2	3	3	3	3																	
		2N	3	3	3	12252	62/75C				2	-	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?	?	?
																						?	?	?	3	2	3	3	2	3	3	100
	+		3	2	3	12782	60/72	A	N.D.	M	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	100
			3	2	3	12829	60/72C				2	-	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	100
	+	4N	3	1	3	5637	62/20	NA	N.D.	M	2Pr.	3	3	2	3	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?
		4N	3	1	3	5422	62/20				2	-	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?	?	?
	+	5N	3	1	3	9575	62/72	A	Breech	M	2Pr.	3	3	2	1	3	1	2	2	3	3	3	3	3	3	3	3	3	3	3	3	100
		4N	3	1	3	8675	62/72C				2	-	3	2	1	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+		3	2	2	9914	60/81	A	F	F	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
			3	2	2	5794	60/81C				2	-	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120

APPENDIX VII

Toxaemia/ Hypertension	No. of Episodes	Past Pregnancies	Gestation	Parity	Age	Case No.	Thesis No.	A/NA	Delivery	Sex	Birth Weight	A.P.H.	P.D.	Resuscitation	Apgar	C.N.S. 1	R.S. 1	C.N.S. 4	R.S. 4	C.N.S. D	R.S. D	6 Week Exam'n G.C.	6 Week Exam'n C.N.S.	2 Year Examination Weight	Height	Milestones	C.N.S.	Feeding	Sleeping	Talking	Behaviour	S.Q.
	++		3	2	3	10548	61/45	A	F	F	2	3	3	3	2	3	3	2	3	2	3	2	2	2	2	2	2	3	2	3	2	90
			3	2	3	11198	61/45C				2	-	3	3	2	3	3	2	3	3	3	2	3	3	3	3	3	3	3	3	100
	+		3	2	2	8357	60/29	NA	C.S.	F	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	90
			3	2	2	8098	60/29C				2	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	++		3	2	3	11481	61/66	NA	C.S.	M	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	95
			3	2	3	11061	61/66C				2	-	3	3	3	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?
T	+	1N	3	3	3	7964	60/11	NA	N.D.	F	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
T		1N	3	3	3	8120	60/11C				2	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	1N	3	3	3	691	60/28	A	N.D.	M	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
		1N	3	3	3	7968	60/28C				2	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
T	+		3	2	3	8102	60/3	NA	N.D.	F	2	3	3	3	3	3	3	3	3	3	3	?	?	?	3	3	3	3	3	3	100
T			3	2	3	8238	60/3C				2	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
T	+		3	2	3	9042	60/21	A	N.D.	F	2Pr.3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	110
			3	2	3	9059	60/21C				2	-	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
T	+		3	2	1	8764	60/45	NA	N.D.	F	2	3	2	3	3	3	2	3	3	3	3	2	3	3	3	3	3	3	3	3	100
			3	2	3	8810	60/45C				2	-	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
T	++	1N	2	3	3	760	61/3	NA	N.D.	F	2	3	2	3	2	3	2	3	2	3	3	3	3	3	3	3	2	3	2	3	90
T		1N	2	3	3	10020	61/3C				2	-	2	3	2	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?
	+	2N	3	3	3	10296	61/21	A	N.D.	F	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
		2N	3	3	3	5409	61/21C				2	-	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	2N	2	3	3	5395	62/26	A	N.D.	M	2	3	2	2	1	3	2	3	2	3	3	3	3	3	3	3	2	3	2	2	96
		2N	2	3	3	2292	62/26C				2	-	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	2N	3	3	3	12316	62/31	A	N.D.	M	2	3	2	3	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?
		2N	3	3	3	5095	62/31C				2	-	2	3	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?
	+		2	2	3	7803	60/20	A	N.D.	F	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
			2	2	3	9293	60/20C				2	-	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
	+		3	2	3	8764	60/50	A	N.D.	M	2Pr.3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
			3	2	3	9104	60/50C				2	-	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+		3	2	3	11062	61/80	NA	N.D.	M	2	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
			3	2	3	11081	61/80C				2	-	2	2	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?
	+	3N	3	3	3	12632	62/42	A	N.D.	M	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
		3N	3	3	3	6238	62/42C				2	-	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120

APPENDIX VIII

Pregnancy									Neo-Natal													6 Week Exam'n		2 Year Examination								
Toxaemia/ Hypertension	No. of Episodes	Past Pregnancies	Gestation	Parity	Age	Case No.	Thesis No.	A/NA	Delivery	Sex	Birth Weight	A.F.H.	F.D.	Resuscitation	Apgar	1 C.N.S.	1 R.S.	4 C.N.S.	4 R.S.	10 C.N.S.	10 R.S.	G.C.	C.N.S.	Weight	Height	Milestones	C.N.S.	Feeding	Sleeping	Talking	Behaviour	S.Q.
T	+		3	2	3	7799	60/2	A	N.D.	F	2Pr.	2	3	2	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	104
			3	2	3	7881	60/2C				2	-	3	2	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	3N	2	3	3	8844	60/27	A	N.D.	F	2	2	3	2	2	3	2	2	3	3	3	3	3	3	3	3	2	2	2	2	95
		3N	2	3	3	2640	60/27C				2	-	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	++	4N	3	1	1	9328	60/63	A	N.D.	M	2Pr.	2	3	2	1	2	2	2	2	3	3	2	3	3	2	2	3	2	2	2	70
		5N	3	1	1	9842	60/63C				2	-	3	2	2	3	3	3	3	3	3	3	3	3	3	2	3	3	3	2	3	96
	++	3N	2	3	3	*11254	61/13	A	N.D.	M	2	2	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	2	2	85
		3N	3	3	3	10028	61/13C				2	-	3	3	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?
	+	2N	3	3	3	11710	61/78	NA	N.D.	M	2Pr.	2	3	2	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	120
		2N	3	3	3	11635	61/78C				2	-	3	2	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	100
	+	1N	2	3	3	5872	61/70	A	N.D.	F	2	2	3	2	1	3	2	3	3	3	3	3	3	3	2	3	3	3	3	3	98
		2N	2	3	3	6913	61/70C				2	-	3	2	2	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?	?
T	+	2N	2	3	3	10548	61/50	NA	N.D.	M	2Pr.	2	3	2	2	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	100
		2N	2	3	3	11528	61/50C				2	-	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	6N	2	1	3	11505	62/1	A	N.D.	M	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
		6N	2	1	3	8765	62/1C				2	-	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?	?
	+	2N	3	3	3	18510	61/69	A	N.D.	F	2	2	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	100
		2N	3	3	3	12836	61/69C				2	-	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	100
	+	2N	2	3	3	113502	62/66	A	N.D.	F	2Pr.	2	3	3	3	3	2	3	3	3	3	3	3	2	2	3	2	3	3	3	100
		3N	2	3	3	4630	62/66C				2	-	3	3	3	3	3	3	3	3	3	3	3	2	2	3	3	3	3	3	100
	+	2N	2	3	3	6169	62/39	A	N.D.	M	2	2	3	2	2	3	3	3	3	3	3	3	3	3	2	3	3	3	2	3	2	96
		2N	3	3	3	3161	62/39C				2	-	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	3N	2	3	3	795	62/9	NA	N.D.	F	2Pr.	2	3	2	2	3	2	3	3	3	3	?	?	?	?	?	?	?	?	?	?	?
		3N	2	3	3	6345	62/9C				2	-	3	2	2	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?	?
	+		2	2	3	12478	62/38	NA	N.D.	F	2Pr.	2	3	2	2	3	2	2	3	3	3	3	3	3	2	3	3	3	3	3	120
			2	2	3	2481	62/38C				2	-	3	2	2	3	2	3	3	3	3	3	3	3	3	3	3	2	3	3	3	100
T	+	1Pr.	2	3	3	11910	62/71	A	F	F	2Pr.	2	3	2	2	2	1	2	2	3	3	2	3	3	2	2	2	3	3	2	3	70
T		1N	2	3	3	11998	62/71C				2	-	3	2	2	3	2	2	2	3	3	2	3	3	2	2	2	3	3	3	3	90
	+	1C	3	3	3	8928	62/63	A	F	M	2Pr.	2	3	2	2	3	2	3	3	3	3	2	3	3	2	3	3	3	3	3	3	100
		2N	3	3	3	12394	62/63C				2	-	3	2	2	3	2	3	2	3	3	3	3	3	2	3	3	3	3	3	3	100

APPENDIX IX

Pregnancy									Neo-Natal													6 Week Exam'n		2 Year Examination								
Toxaemia/ Hypertension	No. of Episodes	Past Pregnancies	Gestation	Parity	Age	Case No.	Thesis No.	A/NA	Delivery	Sex	Birth Weight	A.P.H.	F.D.	Resuscitation	Apgar	C.N.S. 1	R.S.	C.N.S. 4	R.S.	C.N.S. 5	R.S.	G.C.	C.N.S.	Weight	Height	Milestones	C.N.S.	Feeding	Sleeping	Talking	Behaviour	S.Q.
	+	4N	3	1	3	3750	61/64	NA	N.D.	F	3	2	3	2	1	3	2	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?
		5N	3	1	3	3182	61/64C				3	-	3	2	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
	+	1N	3	3	3	6618	60/74	NA	N.D.	F	3	2	3	2	1	2	2	2	3	3	3	3	3	3	3	2	3	3	2	2		75
		1N	3	3	3	9179	60/74C				3	-	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+		3	2	3	7694	60/15	A	N.D.	M	3	2	3	2	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	118
			3	2	3	1375	60/15C				3	-	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
	+	1N	3	3	3	9765	61/11	A	N.D.	F	3	2	3	3	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?
		1N	3	3	3	7864	61/11C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	2N	3	3	3	11350	61/57	A	N.D.	F	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
		2N	3	3	3	11167	61/57C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	6N	3	1	2	3788	61/16	A	N.D.	M	3	2	3	3	2	3	2	3	3	3	3	3	3	3	2	3	3	3	3	3	3	100
		6N	3	1	2	10057	61/16C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	++	2N	3	3	2	2296	61/6	A	N.D.	M	3	2	3	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	2	3	90
		2N	3	3	2	9657	61/6C				3	-	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	++	2N	2	3	2	10039	61/33	A	N.D.	M	3	2	3	2	1	2	2	2	3	2	3	3	2	2	3	1	2	2	3	1	2	51
		2N	2	3	2	10781	61/33C				3	-	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	++	2N	3	3	3	3174	61/25	NA	N.D.	F	3	2	3	2	2	3	2	2	2	3	3	3	3	3	3	3	3	3	3	2	3	96
		2N	3	3	3	10420	61/25C				3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+		3	2	3	11444	62/2	A	N.D.	M	3	2	3	2	2	2	2	3	3	3	3	?	?	?	?	?	?	?	?	?	?	?
			3	2	3	11743	62/2C				3	-	3	2	2	3	2	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?
	++	1N	3	3	3	1753	62/15	A	N.D.	F	3	2	3	2	2	3	2	3	3	3	3	2	3	3	3	3	3	2	2	3	2	96
		1N	3	3	3	9928	62/15C				3	-	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	++	4N	3	3	3	5709	62/55	NA	N.D.	F	3	2	3	2	2	2	2	3	2	3	2	2	3	3	2	2	3	3	2	2	2	85
		3N	3	3	3	13149	62/55C				3	-	3	2	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	3N	3	3	3	*6347	62/57	A	N.D.	M	3	2	3	2	2	3	3	2	3	2	3	?	?	3	3	3	3	3	3	3	3	100
		3N	3	3	3	2205	62/57C				3	-	3	2	2	3	2	3	3	3	3	?	?	3	3	3	3	3	3	3	3	100
	+		3	2	3	12672	62/58	NA	N.D.	M	3	2	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?	?
			3	2	3	12767	62/58C				3	-	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?	?
	++	5N	2	1	3	13095	62/60	A	N.D.	M	3	2	3	2	1	2	2	3	2	3	3	2	3	3	2	2	3	3	2	2	3	85
		4N	2	1	3	8311	62/60 C				3	-	3	2	1	3	2	3	3	3	3	3	3	3	2	3	3	3	3	3	3	100

APPENDIX X

Pregnancy									Neo-Natal														6 Weeks Exam'n		2 Year Examination								
Toxaemia/ Hypertension	No. of Episodes Past Pregnancies	Gestation	Parity	Age	Case No.	Thesis No.	A/NA	Delivery	Sex	Birth Weight	A.P.H.	P.P.	Resuscitation	Apgar	1 C.N.S.	1 R.S.	4 C.N.S.	4 R.S.	10 C.N.S.	10 R.S.	G.C.	C.N.S.	Weight	Height	Milestones	C.N.S.	Feeding	Sleeping	Talking	Behaviour	S.Q.
+	2N	3	3	3	8078	62/65	A	N.D.	M	3	2	3	2	2	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	2N	3	3	3	7857	62/65C				3	-	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
+	2N	3	3	2	9682	60/79	NA	N.D.	F	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	2N	3	3	2	9692	60/79C				3	-	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	110
+	2N	3	3	3	9843	60/76	NA	N.D.	F	3	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	2N	3	3	3	5448	60/76C				3	-	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
+		3	2	2	8002	60/16	A	N.D.	M	3	2	2	2	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
		3	2	2	8298	60/16C				3	-	2	2	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
++	5N	2	1	2	*11233	61/27	NA	N.D.	M	3	2	2	2	1	3	2	2	2	3	3	3	2	3	3	2	3	3	3	2	2	85
	5N	2	1	2	11308	61/27C				3	-	2	2	2	3	2	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?
+	1N	3	3	3	11174	61/48	NA	N.D.	M	3	2	2	2	2	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?	?
	1N	3	3	3	9152	61/48C				3	-	2	2	2	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?	?
+	4N	3	1	3	7425	62/6	A	N.D.	F	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	4N	3	1	3	3616	62/6C				3	-	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
+	1N	3	3	3	234	60/52	A	F	M	3	2	2	2	1	3	2	3	3	3	3	3	3	3	3	3	3	3	2	3	2	100
	1F	3	3	3	8451	60/52C				3	-	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
+		3	2	3	9094	60/19	A	C.S.	M	3	2	2	2	2	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?	?
		3	2	3	9948	60/19C				3	-	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
+	2N	3	3	3	7838	61/43	A	C.S.	M	3	2	2	2	2	3	2	3	3	3	3	2	3	2	3	3	2	3	3	2	3	96
	2N	3	3	3	10249	61/43C				3	-	2	2	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
+	1N	3	3	3	2038	60/13	A	N.D.	M	3	2	1	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	1N	3	3	3	7769	60/13C				3	-	1	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
+		3	2	2	12006	62/44	A	N.D.	F	3	2	1	2	2	3	2	3	3	3	3	2	3	3	2	3	3	3	3	3	3	100
		2	2	2	12096	62/44C				3	-	1	2	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
++	3N	3	3	2	12994	62/68	A	C.S.	M	3	2	1	1	1	2	2	3	3	2	3	2	2	3	2	3	3	3	2	3	2	96
	2N	3	3	2	3037	62/68C				3	-	1	1	1	3	2	3	3	3	3	3	3	3	2	3	3	3	3	3	3	100
+	2N	3	3	3	*12246	62/3	A	N.D.	M	3	2	1	2	1	3	2	2	2	3	3	?	?	?	?	?	?	?	?	?	?	?
	2N	3	3	3	5311	62/3C				3	-	1	2	2	3	2	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?
+	5N	3	1	1	1262	62/35	A	C.S.	M	3	2	1	2	3	3	2	3	3	3	3	3	3	3	2	3	3	3	3	3	3	100
	5N	3	1	1	12014	62/35C				3	-	1	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100

APPENDIX XI

Pregnancy									Neo-Natal														6 Week Exam'n		2 Year Examination								
Toxaemia/ Hypertension	No. of Episodes	Past Pregnancies	Gestation	Parity	Age	Case No.	Thesis No.	A/NA	Delivery	Sex	Birth Weight	A.F.H.	F.D.	Resuscitation	Apgar	1 C.N.S.	1 R.S.	4 C.N.S.	4 R.S.	10 C.N.S.	10 R.S.	G.C.	C.N.S.	Weight	Height	Milestones	C.N.S.	Feeding	Sleeping	Talking	Behaviour	S.Q.
	+	1Pr.	2	3	3	*12689	62/43	A	F	M	2	2	3	2	2	2	1	2	2	3	3	3	2	3	2	2	3	3	3	3	90
		1N	3	3	3	12254	62/43C				2	-	3	2	2	3	2	3	3	3	3	3	3	3	2	3	3	3	2	3	95
	+	1N	3	3	3	12247	62/54	NA	C.S.	M	2	2	3	3	3	3	2	2	3	3	3	3	3	3	2	2	3	3	3	2	90
		1NND	3	3	3	6889	62/54C				2	-	3	3	3	3	3	3	3	3	3	?	?	3	2	3	3	3	2	2	3	95
T	++	2N	2	3	3	10030	60/69	A	N.D.	F	2Pr.	2	2	1	1	3	2	2	2	3	3	2	3	3	3	2	3	3	3	2	3	90
		2N	2	3	3	1740	60/69C				2	-	2	2	2	3	3	2	3	3	3	?	?	3	3	3	3	2	3	3	3	95
T	++	1Pr.	2	3	3	9000	60/32	A	N.D.	M	2Pr.	2	2	2	1	2	2	2	2	3	3	2	2	3	3	3	2	3	3	2	2	80
		1N	2	3	3	8267	60/32C				2	-	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
T	++		3	2	3	10168	61/8	A	N.D.	M	2	2	2	2	2	3	3	2	3	3	3	2	2	2	2	3	3	2	2	2	3	90
			3	2	3	10763	61/8C				2	-	2	2	2	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?	?	?
	++	1N	2	3	3	4952	61/65	NA	N.D.	F	2Pr.	2	2	2	2	3	2	2	2	3	2	2	3	3	2	3	3	3	3	2	3	90
T		1N	2	3	3	11014	61/65C				2	-	2	2	2	3	2	3	3	3	3	3	3	3	2	3	3	3	3	3	3	100
	+	3N	3	3	3	4950	62/48	A	N.D.	M	2	2	2	3	3	3	3	3	3	3	3	2	3	?	?	?	?	?	?	?	?	?
		2N	3	3	3	12646	62/48C				2	-	2	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?	?	?
	+		1	2	3	11436	61/56	A	F	F	2Pr.	2	2	2	3	2	3	3	3	3	3	3	3	2	2	3	3	3	3	3	3	100
			1	2	3	11462	61/56C				2	-	2	2	2	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	100
	++		2	2	3	11003	60/83	NA	N.D.	M	2Pr.	2	2	2	2	1	2	2	2	3	2	2	3	3	3	2	3	3	3	2	3	85
T			2	2	3	9465	60/83C				2	-	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	++	3N	2	3	3	1197	62/18	A	N.D.	M	2	2	2	3	3	3	2	2	3	2	3	2	1	3	3	2	2	3	3	2	2	75
		2N	2	3	3	11604	62/18C				2	-	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	++	1F	2	3	3	5156	60/22	NA	N.D.	M	2	2	2	2	1	3	2	2	2	3	3	2	3	3	3	3	3	3	2	2	2	90
		1CS	3	3	3	1386	60/22C				2	-	2	2	1	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
T	++		2	2	3	*10186	60/68	NA	F	F	2	2	1	2	2	2	3	2	3	2	3	2	3	3	3	3	3	2	2	3	2	90
T			2	2	3	10526	60/68C				2	-	1	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+++	4N	2	1	3	7718	61/47	A	F	M	2	2	1	2	1	3	2	2	2	3	3	2	2	2	2	2	2	2	2	2	2	65
		4N	3	1	3	8865	61/47C				2	-	1	2	1	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?	?	?
	+		3	2	3	1624	62/12	A	F	M	2Pr.	1	1	1	2	2	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	100
			3	2	3	12247	62/12C				2	-	1	1	1	2	3	3	3	3	3	?	?	3	3	3	3	3	3	3	3	3	120
T	+	1N	3	3	3	4276	61/55	A	C.S.	F	2Pr.	1	1	1	3	2	2	3	3	3	2	2	2	2	3	3	3	3	3	2	96
T		1N	3	3	3	10071	61/55C				2	-	1	2	1	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100

APPENDIX XII

Pregnancy									Neo-Natal													6 Week Exam'n		2 Year Examination								
Toxaemia/ Hypertension	No. of Episodes Past Pregnancies		Gestation	Parity	Age	Case No.	Thesis No.	A/NA	Delivery	Sex	Birth Weight	A.P.H.	P.D.	Resuscitation	Apgar	I C.N.S.	I E.S.	A C.N.S.	A E.S.	D C.N.S.	D E.S.	G.C.	C.N.S.	Weight	Height	Milestones	C.N.S.	Feeding	Sleeping	Talking	Behaviour	S.Q.
	+	8N	1	1	3	5875	61/58	NA	F	M	3	1	2	2	1	3	2	2	2	3	3	2	2	3	3	3	2	2	2	2	65
		5N	3	1	3	7842	61/58C				3	-	2	2	1	2	2	2	3	2	3	3	3	3	3	3	3	3	2	2	95
	++	5N	1	1	3	9698	62/28	A	N.D.	M	3	1	2	2	2	2	2	2	2	3	3	2	2	3	3	2	3	3	2	2	2	75
		4N	3	1	3	11957	62/28C				3	-	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	4N	1	1	1	1437	61/39	NA	F	F	3	1	1	1	1	1	2	2	2	2	3	2	2	2	2	3	2	2	3	2	3	80
		4N	1	1	1	4641	61/39C				3	-	1	1	1	2	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	120
	+	1N	3	3	3	6747	61/79	NA	C.S.	M	2	1	3	2	2	3	2	3	3	3	3	2	2	2	2	3	3	3	2	3	3	96
		1N	3	3	3	7615	61/79C				2	-	3	2	2	3	2	3	3	3	3	3	3	3	2	3	3	3	3	3	3	100
	++	1N	2	3	1	11724	62/7	NA	C.S.	M	2Pr.1		2	1	1	3	2	2	2	2	3	3	3	3	3	2	3	3	3	2	3	90
		1N	2	3	1	03343	62/7C				2	-	2	2	1	3	2	3	3	3	3	3	3	3	3	2	3	3	3	3	2	90
	++	4N	2	1	1	12331	62/52	NA	N.D.	M	2Pr.1		2	2	2	2	1	3	2	2	3	3	2	3	2	2	3	3	3	2	3	85
		4N	2	1	1	12159	62/52C				2	-	2	2	2	3	2	3	3	3	3	3	3	2	2	3	3	3	3	3	3	100
	+	5N	2	1	3	*8900	62/45	A	N.D.	M	2Pr.1		2	2	2	2	1	2	2	2	3	3	2	?	?	?	?	?	?	?	?	?
		6N	2	1	3	7500	62/45C				2	-	2	2	2	3	2	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?
	++	1N	3	3	3	11576	62/14	A	F	M	2	1	2	1	1	2	2	2	2	3	3	3	3	3	2	2	3	2	3	2	2	90
		1N	3	3	3	12065	62/14C				2	-	2	2	1	3	2	3	3	3	3	3	3	3	2	3	3	3	3	3	3	100
	++	1N	2	3	3	9378	62/71	NA	N.D.	F	2Pr.1		1	2	1	3	2	2	2	2	3	3	2	2	2	2	2	3	3	2	3	65
		1N	2	3	3	12628	62/71C				2	-	1	2	1	3	2	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?
	+	1N	2	3	3	*11036	61/18	A	C.S.	M	2Pr.1		1	1	2	2	1	2	2	2	3	2	3	3	3	3	2	2	3	2	2	65
		1CS	2	3	3	*11246	61/18C				2	-	1	1	2	3	2	3	3	3	3	3	3	3	3	3	?	3	3	3	3	100
	+	4N	2	1	3	11903	61/51	NA	C.S.	F	2Pr.1		1	2	2	3	1	2	2	3	3	2	2	3	2	3	2	3	2	2	2	80
		4N	2	1	3	11998	61/51C				2	-	1	2	2	3	3	2	3	3	3	3	3	3	2	3	3	3	3	3	3	100
H	++	1Pr.	2	3	3	*7587	61/23	NA	N.D.	M	1	3	3	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
H			2	2	3	*10990	61/23C				1	-	3	2	2	3	3	3	2	3	3	3	3	3	3	3	3	3	3	2	3	95
	+		1	2	3	*11369	61/30	A	N.D.	M	1	3	3	2	2	2	1	2	2	3	3	2	2	3	3	3	2	3	3	2	3	75
			1	2	3	12046	61/30C				1	-	3	2	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	2N	3	3	3	*8760	60/17	NA	N.D.	F	1	2	3	2	1	3	1	2	2	3	3	3	3	3	2	2	3	3	3	2	3	90
		2N	3	3	3	*6962	60/17C				1	-	3	2	1	2	1	3	2	3	3	?	?	3	3	2	3	3	3	2	3	90
	+		1	2	1	11139	61/28	A	N.D.	M	1	2	3	2	1	3	1	2	2	3	3	3	3	3	3	2	3	3	3	3	3	95
			1	2	1	12005	61/28C				1	-	3	2	1	3	2	3	3	3	3	2	2	3	3	2	3	3	3	3	3	90
	+		1	2	1	*11553	61/29	A	F	F	1	2	2	2	1	3	2	3	2	2	3	3	2	3	2	2	1	3	3	3	3	60
			1	2	1	12257	61/29C				1	-	2	2	1	3	2	3	3	3	3	3	3	3	2	2	3	3	3	2	3	90
	+	3N	1	3	3	12290	62/40	A	C.S.	M	1	2	2	2	1	2	1	2	2	3	3	2	2	3	2	2	3	3	3	2	3	90
			2	3		*12573	62/40C				1	-	2	2	1	3	2	3	3	3	3	3	3	3	2	3	3	3	2	3	2	95

APPENDIX XIII

Pregnancy										Neo-Natal														6 Week Examn.		2 Year Examination								
Toxaemia/ Hypertension	No. of Episodes	Past Pregnancies	Gestation	Parity	Age	Thesis No.	Case No.	Delivery	A/NA	Sex	Birth Weight	A.F.H.	F.D.	Resuscitation	Apgar	C.N.S.	1 R.S.	C.N.S.	4 R.S.	C.N.S.	10 R.S.	G.C.	C.N.S.	Weight	Height	Milestones	C.N.S.	Feeding	Sleeping	Talking	Behaviour	S.Q.
	++		3	2	3	60/41	8408	CS	A	M	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
			3	2	3	60/41C	9850	CS	A	M	3	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	1Pr.	3	3	3	60/48	9011	CS	A	F	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	3	95
		1Pr.	3	3	3	60/48C	7805	CS	A	F	3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	4N	2	1	3	60/73	10146*	CS	A	M	3	3	3	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	100
		4N	2	1	3	60/73C	2553	CS	A	M	3	-	3	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	3N	3	3	3	62/47	12463	CS	A	M	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
		3N	3	3	3	62/47C	12608	CS	A	M	3	-	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	4N	2	1	3	61/5	9951	CS	A	M	3	2	3	2	2	2	2	2	2	3	3	2	2	3	3	2	3	3	2	3	85
		5N	2	1	3	61/5C	9520	CS	A	M	3	-	3	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	3N	3	3	3	61/26	5714	CS	NA	M	3	1	3	2	2	2	2	3	3	3	3	2	3	2	3	3	3	3	3	3	95
		1CS	3	3	3	61/26C	9866	CS	NA	M	3	-	3	2	2	2	2	3	3	3	3	?	?	?	?	?	?	?	?	?	?	?
	+		3	2	1	60/51	9032	CS	NA	F	3	1	2	2	1	2	2	2	3	3	3	2	2	3	3	2	3	2	2	2	75
			3	2	1	60/51C	8559	CS	NA	F	3	-	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	120
	+	4N	3	1	1	62/33	12453	CS	NA	M	3	1	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
			3	2	1	62/33C	12380	CS	NA	M	3	-	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	++		3	2	3	60/14	7768	CS	A	M	2	2	3	2	1	2	1	2	2	3	3	3	2	3	3	2	2	2	3	2	80
			3	2	3	60/14C	9028	CS	A	M	2	-	3	2	2	3	2	3	3	3	3	3	3	3	3	3	3	2	3	3	2	100
	++	5N	2	1	3	60/30	8959*	CS	A	F	2	2	3	2	2	2	1	2	2	3	3	3	2	3	3	2	3	2	3	2	70
			3	2	3	60/30C	8518	CS	A	F	2	-	3	2	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	3N	3	3	3	62/23	12257	CS	NA	M	2	2	3	2	2	3	2	3	3	3	3	3	3	2	2	3	3	2	3	2	90
		1P	3	3	3	62/23C	9924	CS	NA	M	2	-	3	2	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	3N	3	3	3	62/46	9512	CS	A	F	2	2	3	2	2	3	2	3	3	3	3	3	3	2	3	2	3	3	3	3	96
			3	2	3	62/46C	12180	CS	A	F	2	-	3	2	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	5N	3	1	3	62/67	13468*	CS	A	F	2	2	3	2	2	2	2	3	3	3	3	3	3	3	3	2	3	3	2	3	2	95
			3	2	3	62/67C	12365	CS	A	F	2	-	3	2	2	3	2	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?
	+	5N	3	1	3	62/70	9101	CS	A	M	2	2	3	2	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	100
		1_N		3	3	62/70C	12192	CS	A	M	2	-	3	2	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	1N	3	3	3	61/7	10056	CS	A	M	2	2	2	2	1	2	1	2	2	3	3	3	3	3	3	2	3	3	3	2	85
		1N	3	3	3	61/7C	11107	CS	A	M	2	-	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	5N	2	1	1	61/74	11275*	CS	A	M	2	2	2	2	1	2	1	2	2	2	3	2	3	2	3	2	3	2	3	2	90
			2	1	61/74C	10678	CS	A	M	2	-	2	2	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	90
	+		3	2	3	61/2	9941	CS	NA	F	2	3	3	3	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?
			3	2	3	61/2C	10792	CS	NA	F	2	-	3	3	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?
	+	3N	3	3	1	61/36	6836CS	CS	A	F	2	3	3	3	3	2	2	2	2	3	3	2	2	2	2	3	2	3	2	2	75
			3	2	1	61/36C	1127	CS	A	F	2	-	3	3	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	100

APPENDIX XIV

Toxaemia/ Hypertension	No. of Episodes	Past Pregnancies	Gestation	Parity	Age	Thesis No.	Case No.	Delivery	A/NA	Sex	Birth Weight	A.F.H.	F.D.	Resuscitation	Apgar	C.N.S. 1	R.S.	C.N.S. 4	R.S.	C.N.S. 9	R.S.	6 Week Exam'n S.C.	6 Week Exam'n C.N.S.	2 Year Examination Weight	Height	Milestones	C.N.S.	Feeding	Sleeping	Walking	Behaviour	I.Q.
	+	2N	3	3	3	62/30	12031	CS	A	M	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	96
		1CS	3	3	3	62/30C	3972	CS	A	M	2	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	6N	2	1	3	62/36	861*	CS	NA	F	2	3	3	3	3	3	2	2	2	3	2	3	2	2	3	2	3	3	3	3	90
		4N	3	1	3	62/36C	12886	CS	NA	F	2	-	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+		3	2	1	61/1	9839	CS	A	F	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
			3	2	1	61/1C	10176	CS	A	F	2	-	2	3	3	2	2	3	3	3	3	2	3	3	3	3	3	3	3	3	100
	+	1N	1	3	3	61/4	4128	CS	A	F	2	3	2	2	2	3	2	2	2	3	3	3	2	2	3	3	3	2	2	2	90
		1Pr.	1	3	3	61/4C	1596	CS	A	F	2	-	2	2	2	2	2	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?
	+	3N	2	3	3	61/35	11108	CS	NA	F	2	3	2	2	2	2	2	2	2	3	2	3	2	3	3	2	3	3	3	2	90
		2N	2	3	1	61/35C	10730	CS	NA	F	2	-	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	3N	2	3	3	61/40	8060	CS	A	F	2	3	2	2	2	3	2	3	3	3	3	3	3	2	2	3	3	3	3	3	100
		1CS	2	3	3	61/40C	5483	CS	A	F	2	-	2	2	2	3	2	3	3	3	3	3	3	3	3	3	3	3	2	3	95
	+		1	2	3	60/82	10149	CS	NA	F	2	1	3	1	1	3	1	2	2	3	3	3	2	2	3	2	2	3	2	3	50
T			1	2	3	60/82C	8388	CS	NA	F	2	-	3	2	2	3	2	3	3	3	3	3	3	3	3	3	3	2	3	3	95
	+	5N	3	1	1	61/76	12024*	CS	NA	F	2	1	3	1	1	3	1	2	2	2	3	2	2	2	2	2	2	3	2	3	55
		6N	3	1	1	61/76C	9616	CS	NA	F	2	-	3	2	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	1N	3	3	3	61/81	11643	CS	A	M	2	1	3	1	1	2	1	2	2	3	3	?	?	1	2	2	2	2	3	2	2	25
		1CS	3	3	3	61/81C	3964	CS	A	M	2	-	3	1	2	3	2	2	2	3	3	3	3	3	3	2	3	3	3	3	3	96
	+	1N	3	3	3	61/49	9031	CS	NA	F	2	1	2	2	2	3	2	3	3	3	3	3	3	2	2	2	3	3	2	3	3	90
		4N	3	1	3	61/49C	10476	CS	NA	F	2	-	2	2	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	1N	3	3	3	62/56	12447	CS	NA	F	2	1	2	2	2	2	2	2	2	3	3	3	3	3	3	2	2	3	3	2	2	80
		4N	3	1	3	62/56C	12860	CS	NA	F	2	-	2	2	2	3	2	3	3	3	3	3	3	3	3	2	3	3	3	3	3	90
	+	2N	3	3	3	60/10	8731	ND	A	F	3	3	3	3	3	3	3	3	3	3	3	Did not attend. Army family - Overseas posting.									
		No control chosen, see 60/10.																														
T	+	4N	3	1	3	60/40	8948	ND	A	M	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	120
		4N	3	1	3	60/40C	5613	ND	A	M	3	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+		3	2	2	62/8	9587	ND	A	M	3	3	3	2	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	100
			3	2	2	62/8C	9594	ND	A	M	3	-	3	2	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	100
	+	2N	3	3	2	62/59	13462	ND	A	M	3	3	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?	?
		2N	3	3	2	62/59C	8175	ND	A	M	3	-	3	3	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?
	+	5N		1	3	60/58	1015	ND	A	F	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	98
		6N		1	3	60/58C	6928	ND	A	F	2	-	2	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	100
	+	6N	2	1	3	61/10	433	ND	A	F	1	2	3	3	3	3	3	3	3	3	3	3	3	3	2	2	3	3	3	2	3	96
		5N	2	1	3	61/10C	1857	ND	A	F	1	-	3	3	3	3	3	3	3	3	3	?	?	?	?	?	?	?	?	?	?	?

APPENDIX XV

COPY OF FORMS USED IN STUDY

PREGNANCY RECORD

"A.P.H."/ Control

Case No. ..... Thesis No. .....
Name:
Address: Single:
Family Doctor:
Nationality:
Booked/Unbooked:
Medical History:
Past Obstetric History:
Miscarriages:
Family History:

PRESENT OBSTETRICAL SUMMARY

Course of present Pregnancy:
Illness:
Bleeding before 28 weeks:
Essential hypertension:
Moderate toxaemia:
Severe toxaemia:
Anaemia:
Version:

Age:
Parity:
Gestation:

LABOUR
Spontaneous/Induced:
Duration:
Membranes ruptured:
Foetal Heart: (Rate)
Analgesia/Anaesthesia:
Maternal Distress:

A.P.H.	Gestation	Treatment	Hospital
1st. Bleed:			
2nd. Bleed:			

Amount: 0-5 ozs./5-20 ozs./ + 20 ozs.

NEONATAL RECORD

Delivery: Date ..... Time .....

Normal:
Forceps:
Breech:
Caesarian Section:
Other:
Amniotic Fluid:
Placenta:
Abnormalities

IMMEDIATE STATUS OF INFANT

Name:
Birth Weight:
Sex:

Time of First Breath:

Apgar Score:

Resuscitation
Suction:
Posture:
Drugs:

Oxygen
Intra nasal:
Endotracheal:
Other:

Blood:	Mother	Baby
Group:		
Rh.:		
Coombs:		
Hb.:		
Bilirubin:		

DISCHARGE SUMMARY Date .....Days in Hosp....
Measurements: Head:
Chest:
Length:
Medical Examination:

Feeding
Breast:
Artificial:
Special Features:

SUBSEQUENT NEUROLOGICAL/OTHER NEONATAL RECORD

	1st. 24 hours	4th Day	On Discharge
Name:			
Weight:			
Body Temp.:			
Humid Crib:			
Heart Rate & Murmurs:			
Pallor:			
Cyanosis:			
Resp. Rate:			
Type Resp.			
Resp. Distress Syndrome:			
Lethargy:			
Activity:			
Cry:			
Muscle Tone:			
Resting position:			
Spontaneous movements:			
Moro:			
Other Neonatal Reflexes:			
Abdominal:			
Legs: Position/Activity			
Postural Reflexes:			
"Stepping":			
Tonic Neck Pattern:			
Sucking:			
Twitching:			
Convulsions:			
Fontanelle:			
Anaemia:			
Jaundice:			
E.N.T.:			
Abdomen:			
Genitalia:			
Spine:			
Extremities: Arms/Hips/Feet			
Skin:			
Congenital Abnormalities:			
Drugs & Treatment:			
Special Comments:			

APPENDIX XVI

POST NATAL VISIT

Name: Thesis No.
Age:

Weight:
Height:

Head: (Circumference)
Chest:

General Condition:
Fontanelle:
Heart:
Femoral Pulses:
Chest:
Abdomen:
Hips:
Eyes:
Hearing:

C.N.S.
Posture/ Spontaneous Movements:
Follow light:
Reflexes:

Feeding:

Illnesses:

Comments:

Hb.

Urine:
Albumen
Phenyl ketonuria
Reducing

"2 YEAR OLD" EXAMINATION

Name: Thesis No.

Examination at

1. Has baby suffered from any illnes or accidents since 6 weeks old?

	1 year	18 Months	2 Years
2. Has baby had:			
a. Difficulty with feeding			
b. Vomitting			
c. Sleep			
d. Cough			
e. Stools			
f. Behaviour			
g. Any other condition			

3. When did he:
Sit up
Crawl
Stand up
Walk
Any words

EXAMINATION

Weight:
Height:
Skull:
Chest:
Urine:
Albumen
Phenyl ketonuria
Reducing
Teeth

MEDICAL
General Condition:
Paller:
Hb.:
Hearing:
Eyes:
Heart:
Femoral Pulses:
Chest:
Abdomen:
Posture:
Gait:
C.N.S.
Other Features:
Special Comments:
Immunization:

VINELAND SOCIAL MATURITY SCALE

EDGAR A. DOLL, Director of Research

Name.....Sex.....Date.....

Born.....Informant.....

Age Levels 0-1

1. "Crows"/laughs
2. Balances head
3. Grasps object within reach
4. Reaches for familiar persons
5. Rolls over
6. Reaches for nearby objects
7. Occupies self unattended
8. Sits unsupported
9. Pulls self upright
10. "Talks"/imitates sounds
11. Drinks from cup or glass assisted
12. Moves about on floor
13. Grasps with thumb and finger
14. Demands personal attention
15. Stands alone
16. Does not dribble
17. Follows simple instructions
18. Walks about room unattended — 1-2 (Age Levels)
19. Marks with pencil or crayon
20. Masticates food
21. Pulls off socks
22. Transfers objects
23. Overcomes simple obstacles
24. Fetches or carries familiar objects
25. Drinks from cup or glass unassisted
26. Gives up baby carriage
27. Plays with other children
28. Eats with spoon
29. Goes about house or yard
30. Discriminates edible substances
31. Uses names of familiar objects
32. Walks upstairs unassisted
33. Unwraps lollies
34. Talks in short sentences
35. Asks to go to toilet — 2-3 (Age Levels)
36. Initiates own play activities
37. Removes coat or dress
38. Eats with fork
39. Gets drink unassisted
40. Dries own hands
41. Avoids simple hazards
42. Puts on coat or dress unassisted
43. Cuts with scissors
44. Relates experiences