INTRODUCTION

In 1947 neuropathologist J.A.N. Corsellis began work with a team, developed by Dr. Rolf Strom-Olsen the medical director of Runwell Hospital which was a large, well equipped psychiatric Hospital. This team comprising of small research units in neurochemistry, psychology, electroencephalography and neuropathology were committed to psychiatric research. Dr. Corsellis later became Professor of Neuropathology at the Institute of Psychiatry, London, returning to Neuropathology at Runwell Hospital to spend the last years of his working life until his death in 1994, on his main passion of research into psychiatric and neurological diseases.

Professor Corsellis developed the neuropathology department brain bank with a flair and meticulous attention to detail which permeated all aspects of procedure particularly the care of brain specimens that are the raw material of research.

Although founded on specimens from Runwell Hospital the work of Professor Corsellis attracted further specimens from all over the world. This has brought about a unique collection of psychiatric, neurological and normal material which now totals almost 9000 specimens.

Professor Corsellis' research has covered many and varied aspects such as aging and dementia, brain damage in boxing, epilepsy, schizophrenia, Huntington's Chorea and the cerebral degenerative process associated with normal aging. He also wrote Government reports on the safety of whooping cough vaccine and on cerebral damage caused by the use of cannabis. His seminal work on brain injury in the sport of boxing became the driving force behind several significant changes in boxing legislation, such as the reduction of rounds in world championship bouts, compulsory use of head gear in all amateur contests and the total abolition of boxing in all UK schools.

In 1968 Dr. Clive J Bruton joined the team and developed further research projects into Parkinson's disease, depression, Creutzfeldt-Jakob disease and temporal lobe epilepsy which influenced the surgical treatment of epilepsy in future years. His work into temporal lobe epilepsy had the rare distinction of being published by the Institute of Psychiatry as a Maudsley Monograph

A complete computerised catalogue of diagnostic categories has been produced where almost all pychiatric illnesses are represented, many in large numbers. For example, some 1500 cases of neuropathologically confirmed Alzheimer's disease, along with several hundred other cases of non-Alzheimer "organic" dementia. There are over 600 cases of Huntington's Chorea, 700 cases of epilepsy, 650 cases of schizophrenia and many hundreds of cases with affective disorder. A particular interest in normal aging has led to a collection of over 500 nonagenarian and some few centenarians. From a now closed learning difficulties hospital some 200 specimens were received. Departmental interest in clinico-neuropathological studies led to the collection of over 1200 normal control cases. Parkinson disease, multiple sclerosis, encephalitis and numerous other diseases including a substantial number of drug and alcohol abuse and suicides are to be found in the catalogue. (SEE APPENDIX 1)

The department was funded from the National Health Service [NHS] and small grants from the Medical Research Council [MRC] until 1985 when government reorganisation removed NHS patient funding from research. The MRC continued funding the collection with the NHS providing premises and associated facilities. In 1995 full management of the collection transferred to the Southend Community Care Services NHS Trust. At this time the bank received considerable international media interest from journalists and television. The Trust believed that a comprehensive brain banking service should be made easily accessible and widely available to the scientific and medical communities and as a major mental health care provider should continue the collection of suitable material in a controlled and sensible manner.

Subsequently the Corsellis Collection has operated as an independent brain bank and continued to develop links and increase business with academics and industry to provide high quality services to the scientific community. Its customer base now reaches both the UK and across the world with such institutions served within the last two years as:

- The National Alliance for the mentally ill (NAMI) Stanley Foundation Research Awards Programme USA on Schizophrenia.
- The University of Medicine and Dentistry New Jersey USA on Multiple Sclerosis.
- The Theodor Theohari Cozzika Foundation Athens Greece on alcoholism.
- The Medical Research Centre Bombay India on Alzheimer's Disease.
- The Charing Cross and Westminster Medical School University of London UK on schizophrenia.
- The newly formed company Pharmagene Hertfordshire UK which specialises in the use of human tissue to assess natural dynamics of the human genome for pharmaceutical companies.

Runwell hospital is due for closure in 1998 and the Chairman is encouraging sponsorship and investment in the Corsellis Collection relocation, as services are removed from the hospital site.

THE BRAIN BANK

The bank is an essential repository for basic scientists whose research involves the study of post-mortem brain. It provides a link between clinicians and scientists in order to encourage, enable and engage scientists to use their standardised high technology to search for the cause or origin of neurological and psychiatric diseases which could result in development of diagnostic tests or biological markers of disease activity, or to lead to treatments of such diseases.

At present the Corsellis Collection comprises approximately 9000 formalin fixed brains along with their relevant tissue blocks and histological sections. In recent years brain material has been snap frozen and stored at -80°C. Where possible all clinical histories are obtained together with post-mortem and neuropathological reports. The histories include:

- Drug histories
- Psychiatric assessments
- Laboratory tests
- Medical treatments
- Physical examinations
- Neurological examinations

Each case is diagnostically catalogued according to the International Statistics Classification of Diseases and Related Health Problems (ICD 10) and databased.

Using Standard operating procedures and modern health and safety methods as defined in the Laboratory Manual, (see Appendix 11) brains are collected whole as near to time of death as is possible in cool boxes and transported to the laboratory where they are recorded, weighed and standardly photographed prior to snap freezing of standard regions. These are then stored at -80°C and entered on to the freezer database and the remaining brain undergoes the fixation process.

The cases are then diagnosed histologically from standard paraffin embedded blocks which are sectioned at 10 microns (μ) and appropriately stained to ensure the Consultant Neuropathologist can provide an accurate diagnosis of the case.

Due to the non-selective policy practised in providing a diagnostic service and attracting brain donations, a diversity of material has been created and has the flexibility and staff dedication to meet customer needs.

To improve accountability much of the research work carried out in this laboratory, and with other collaborators, is conducted blind and codes are therefore provided until a project is completed.

If a requester of tissue has a worthy scientific hypothesis and standardised methods the Collection will where possible accommodate their requirements. It would not be our role to review or censor any such requests it would be assumed that granting agencies will have approved the work to be

undertaken. It is in our view very important to encourage basic scientists to apply their theories and that new technology and methods drive discovery.

Agreement is required from investigators that they follow approved biosafety standards when working with the material obtained from the bank.

It is our intention that the researcher will be given the name of sponsors supporting the Corsellis Collection Brain Bank's work with a requirement that they are acknowledged in any publications on projects supplied by the collection.

Quality control must be and is a daily responsibility as user satisfaction is important in assessing improvements and in deciding marketing strategies.

It is estimated that the cost of storing and processing of one brain is £600 which includes post-mortem and neuropathology reports, technical time, secretarial time, neuropathologist time, photography, histology, freezer vigilance and capital depreciation, consumables, postage and telephone. It does not include electricity or rent of the building.

As newer and more sophisticated research methods are introduced the demand for human brain and other nervous and indeed non nervous tissues will continue to increase. This trend is mirrored in the growing realisation that important answers to the etiopathogenesis of psychiatric and neurological diseases will only be found by intensive study of the human nervous system. Experimentation and experience have shown that reliable and valid information can be obtained from high quality post-mortem tissue.

BENEFITS OF A LARGE DIVERSIFIED BRAIN BANK

There are some 45 specialist brain banks in the USA, 8 specialist brian banks in the UK and several more across the EC. The Corsellis Collection is the largest brain bank in the world.

The bank can enable the scientist not conversant with neuroanatomy or who cannot obtain a supply in sufficient quantities to undertake a meaningful project to receive high quality, accurately catalogued, access to cases.

A brain bank must be flexible in reflecting customers needs and the quality services it supplies. There are several important elements as to why a brain bank should be large and diverse. For any particular neuropsychiatric disease to be studied by a scientist they will need normal controls, that is without clinical or neuropathological disease, and other psychiatric diseases as controls in order to identify the neurochemical, neuroanatomical, neuroimmunological or neurovirological features of a particular disease. A large catalogue of diseases is important to be able to furnish sufficient quantities of material for statistically valid studies and also to provide enough diversity of material for both disease and control cases that have been uniformly collected, collated and processed.

A large unified brain bank maintained by competent technical staff who are familiar with the material is the most cost effective, even handed, method of distributing the archive to the scientific community. This view is strengthened by the fact that past attempts to dismantle and redistribute brain archives have always failed A tragic example of this concerns the massive psychiatric brain collection at St. Elizabeth's Psychiatric Hospital Washington now lying unused in the American

Armed Forces Institute of Pathology. A similar example is seen in the disuse of the large collection of learning difficulty brains once collected at Carshalton Surrey UK.

This year 1997 the need for a large number of disease categories has been demonstrated with the current interest of "mad cow disease" producing a new variant Creutzfeldt- Jakob disease (nvCJD) - where a contract for a Quantitative Investigation of the Clinicopathological variability of Prion Disease using almost 600 cases identified from the Corsellis Collection catalogue, has been awarded by the UK government for this project. Specialised brain banks do not have this diversity of material.