and, that 'possession' of an action is potentially phenomenologically distinct from such initiation. Evidence taken from the psychotic symptomatology of 'passivity', delusions of alien control, and of thought insertion; the neurological literature on the 'alien' limb; and that on the neurophysiological correlates which precede 'willed' action, leads to the conclusion that 'willed' activity is initiated out of consciousness, and *prior to* phenomenological awareness. Referring to original functional imaging data obtained from schizophrenic subjects the author will demonstrate that the misattribution of 'willed' actions to 'alien' entities is itself associated with aberrant *spatial* distribution of neuronal activity within the motor system. Thus, neurological time and space may potentially characterise the experience of Free Will.

NEUROCOMPUTAL MODELS OF PSYCHOPATHOLOGY: WHAT CAN WE LEARN?

M. Spitzer. *Experimental Psychopathology Section, Department of Psychiatry, University of Heidelberg, Voss-Str. 2, D-69115 Heidelberg, Germany*

Neural network simulations of psychopathological syndromes and symptoms have been proposed for almost a decade. Given their impact on other fields (as diverse as psychology and engineering), the reception on neural network models by psychiatrists appears to be slow, although their potential as a tool for understanding psychopathology is enormous. To make this point, the principles of parallel distributed processing are introduced briefly and simulation examples relevant to psychopathology are discussed. (1) Some aspects of autism have been modeled using a hidden layer with too many neurons, giving rise to a lack of abstract thinking and an increased capacity to memorize rote facts. (2) Hallucinations and delusions have been modeled either with Hopfield networks or with Elman networks. (3) The interaction of the hippocampus and the cortex in learning and memory has been modeled by interacting networks, one for short-term storage and another for long-term storage. The effects of dementia and of age have been simulated. (4) Finally, even affect has been modeled using neural networks. It is shown that network models of psychopathology are not just a recent fad, but an increasingly important branch of psychopathological study. This is highlighted by the fact that each of the models which are going to be discussed has therapeutic implications.

"BRUTE FACTS"

Kathleen V. Wilkes.

This paper complains about the unwillingness of philosophers to turn their attention to the use of non-human animals as models for human intellectual capacity. Psychologists have, to some small extent, realised the need to examine the "Comparative Assumption" ("CA") in psychology — whether, and when, we can use data from animals to generate hypotheses about human abilities — but much more needs to be done.

This paper — which will be pursued by other (linked) papers about the Comparative Assumption in physiology and psychophysiology, and about the weaknesses of computer models — mainly emphasises the *difficulties* of the CA. The author hopes to turn, in a follow-up paper, to the way in which the CA is vastly superior to other models of the human mind. The negative tenor of the paper should not be taken to suggest that the CA is not in fact the best hope for progress in the endeavour to understand human cognition.

S70. Perspective on schizophrenia: personal and professional

Chairmen: J Gerlach, R Murray

THE PHARMACO-ECONOMICS OF SCHIZOPHRENIA: NEW HORIZONS

K.J. Aitchison, R.W. Kerwin. *Section of Clinical Neuropharmacology, Dept Psychological Medicine, Institute of Psychiatry, De Crespigny Park, Denmark Hill, SE5 8AF*

The treatment of the 300,000 affected with schizophrenia in the UK annually costs the NHS at least £300M [1], 80% of this comprising inpatient hospital costs. Any treatment which leads to a clinical improvement sufficient to cause a significant decrease in percentage of time spent as a hospital inpatient would be expected to result in a pharmacoeconomic gain.

Clozapine is an example of an atypical agent which appears to have such a result in treatment-resistant schizophrenia. Between 30% to 60% of previously unresponsive patients appear to derive significant clinical benefit from clozapine [2]. Studies based in the USA show a $10,000–$30,000 savings per year per patient by the second year of clozapine treatment [3], as a direct result of the decreased need for hospitalisation. In a UK clinic-based cost-effectiveness study (n = 26), comparing the 3 years prior to commencing clozapine with the period following establishment of clozapine treatment (mean 36.4 months), we have shown that the cost-effectiveness of clozapine in this group was about twice that of conventional neuroleptics, with a mean net cost saving of £3,000 per patient per annum. The increase in service costs (including the pharmacy and monitoring costs) and accomodation costs on clozapine was more than offset by the reduction in costs attributable to inpatient stays.

Further studies to compare the efficiency of other pharmacological approaches to the treatment of schizophrenia are required. Risperidone has been reported to be clinically efficacious in short-term studies [4], but data regarding long-term outcome are not yet available. New agents (eg olanzapine or sertindole) may likewise prove to be superior to typical neuroleptics, and, furthermore, appropriate as first-line therapy if proven to be safe. The identification of correlations between clinical heterogeneity and pharmaco-economic outcome could further advise prescribing practice and resource allocation.

[1] Smith K, et al. Brit J Psychiat 1995, 166, 9–18.
[2] Kane JM. Brit J Psychiat 1992, 160 (suppl 17), 41–45.
[3] Meltzer HY. Eur Psychiat 1995, 10 (suppl 1), 19s–25s.
[4] Chouinard G, et al. J Clin Psychopharmacol 1993, 12, 25–40.

ANTIPSYCHOTIC DRUGS: THE CURRENT LIMITATIONS AND FUTURE PROMISES

Jeffrey A. Lieberman. *The University of North Carolina at Chapel Hill, CB #7169, School of Medicine, South Wing, Chapel Hill, NC 27599-7160, USA*

The advent of neuroleptic drugs was one of the great breakthroughs in pharmacotherapeutics by biomedical science in the 20th Century. Antipsychotic drugs have proven efficacy in alleviating psychotic symptoms and preventing their recurrence in idiopathic and drug induced psychotic disorders. However, more than 40 years of experience with these compounds have clearly revealed the limitations of their efficacy. These include the fact that: 1) neuroleptics are not effective in all patients with schizophrenia; 2) they do not exert

https://doi.org/10.1016/0924-9338(96)88669-X Published online by Cambridge University Press

therapeutic effects against all domains of schizophrenic morbidity; 3) they have an extensive side effect profile. The thrust of new drug development has been to identify new compounds that have enhanced antipsychotic efficacy and reduced side effects as compared to standard neuroleptic compounds. Toward this end, drug development strategies have been employed which depart from the standard approaches which pursued D-2 receptor antagonism as the "Holy Grail" of antipsychotic activity to produce novel compounds instead of "me too" neuroleptics.

Several lines of research have been pursued which can be summarized as follows: 1) selective dopamine receptor (D-1, D-2, D-3, D-4) antagonists; 2) serotonin receptor (5-HT-1a, 1c, 2, 3, 6, 7) or mixed 5-HT2/D-2 receptor antagonists; 3) selective dopamine agonists or partial agonists; 4) mixed neuroreceptor antagonists that combine multiple pharmacologic properties, e.g, DA, 5-HT, adrenergic, etc; 5) sigma site antagonists; 6) neuropeptide agonist/antagonists. In addition to more favorable side effect profiles, a typical antipsychotic drugs offer the promise of superior efficacy that may be reflected in various measures of disease morbidity as well as provide new insights into the pathophysiological basis of schizophrenia. Clozapine, remoxipride and risperidone are the first atypical antipsychotic drugs to become available for clinical use. Other compounds, including olanzapine, sertindole, seroquel, iloperidone and ziprasidone among others, are in development many of which should become available between now and the end of this century.

HOPE FOR A NEW BEGINNING

Lori Schiller, Nancy Schiller.

There is hope for the mentally ill. We know it. We have experienced the emergence from the hell of madness to a life where pleasure and tranquillity are the true reality. We use the plural "we" because mental illness is not the problem of an individual but the concern of family and friends as well. We suffer together.

Lori Schiller was an exceptionally bright, achieving and socially adept youngster who seemed to excel in everything she did. Suddenly, however, she began to experience the symptoms of a severely mentally ill teenager. She had visual and auditory hallucinations, had trouble concentrating in school, had thoughts of self-destruction, and felt out of control in her social and work relationships. She kept these thoughts and feelings hidden for several years, but ultimately was hospitalized after a suicide attempt at age 21. It was only then that the family became aware that a significant problem existed.

During the nearly nine years of psychiatric hospitalization that followed, she had 21 electric shock treatments, was given dozens of different forms of medication (both neuroleptic drugs as well as those to counteract their side effects), had several psychotherapists and was subject to various demeaning "therapies" that serve to quiet rather than resolve the turbulence of the helpless patient. Diagnosed initially as having a "schizoaffective disorder," she was so sick at one point that an attendant was prescribed to be within arms length at all times, 24 hours a day.

The private hospital where she had been "housed" for a number of years decided they could help her no further and suggested that she be placed in a state institution for the remainder of her life with little hope for improvement, let alone recovery. Fortunately, Lori heard about an experimental drug, Clozaril, that was being considered for certain patients. The staff was hesitant to include Lori in the experimental group because of potentially serious side effects of the medication. Nevertheless, we insisted and thus embarked on the road to recovery.

Lori is out of the hospital for more than six years. She has her own apartment, drives her own car, has an active social life and works as a management case worker with the recovering mentally ill and substance abusers. She has co-authored a book, "The Quiet Room", published by Warner Books and translated into more than seven languages. The book details her illness, the impact it has had on her family and friends, and her escape from schizophrenia. She now travels the world with her mother. Nancy, giving a message of hope to patients, their families and the mental health workers who too often give up prematurely. They are now collaborating on a monograph for families of the mentally ill, giving them hope and guiding them on how to deal with the multi-faceted issues involved with schizophrenia.

Their presentations will include Lori's personal story of hope and recovery, while Nancy will address issues of stigma, guilt and the interaction with physicians and other mental health workers.

THE USE OF COGNITIVE BEHAVIOUR THERAPY IN THE TREATMENT OF SCHIZOPHRENIA

Nicholas Tarrier. *Professor of Clinical Psychology University of Manchester*

This paper will discuss the recent developments in the use of cognitive behaviour therapy in the treatment of schizophrenia. A number of approaches have been developed simultaneously in the UK and this paper will focus mainly on that developed in Manchester. The literature suggests that a significant group of patients who suffer from schizophrenia will continue to experience persistent hallucinations and delusions despite the use of neuroleptic medication. These persistent symptoms are frequently distressing and interfere with the patient's ability to function. A number of researchers have noted that many patients who do experience such persistent symptoms make active attempts to cope, master or overcome these psychotic symptoms and the emotions that they evoke. From this finding we devised a treatment approach that was designed to enhance a patient's ability to cope with their psychotic symptoms by systematically training them in coping strategies. In our first trial we compared this coping training with another cognitive behavioural approach, problem solving. We predicted that coping training would significantly reduce positive psychotic symptoms and would also result in an improvement in the patient's level of social functioning. The problem solving treatment, however, should have no affect on psychotic symptoms but should improve functioning. The results showed that both coping and problem solving resulted in a decrease in psychotic symptoms compared to waiting time, during which there was no improvement. There was some evidence suggesting greater benefit from coping training compared to problem solving. Both treatments were well received by the patients. However, neither treatment resulted in any improvements in negative symptoms or in social functioning. In our second trial an extended treatment was devised that combined coping training, problem solving and relapse prevention strategies. This treatment was compared to supportive psychotherapy and to routine care. The preliminary results from this trial will be discussed. These initial trials have been addressing the problems of patients with persistent drug-resistant psychotic symptoms there is now preliminary evidence that cognitive behaviour therapy can be used effectively with patients admitted to hospital for an acute episode and results in speeded recovery and decreased time in hospital. The results of our pilot study in Manchester will be described along with a multi-site inpatient study funded by the MRC which has just started.