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During the early decades of the 19th century, Philippe Pinel made Paris one of the first centres of a recognizably modern clinical psychiatry. His work was continued by Esquirol and amongst Esquirol's pupils was a psychiatrist, who is little known nowadays, Joseph Moreau de Tours. Moreau de Tours' studies with hashish were published in Paris in 1845 (Moreau de Tour's, 1845). In some respects they can be considered the first scientifically planned psychopharmacological experiments (Carlsson, 1990; Jaspers, 1913; Baruk, 1992).

There was considerable debate about what if anything the effects of taking compounds such as hashish, alcohol or the opiates might reveal about psychological functioning. On the one hand authorities such as William James (James, 1902) proposed that the ecstatic states experienced on centrally acting compounds might reveal useful information about the constitution of human nature in one of its most intimate aspects. A more cynical view of the same was taken by Henry Maudsley, to the effect that the production of apparently religious ecstasy by such drugs indicated that there was no more to any supernatural seemings than natural causes (Maudsley, 1897). More generally, however, the central effects of exogenous compounds were discussed under the heading of the effects of poisons by most authors (see Jaspers, 1913/1963). The tradition of considering such studies in terms of poisoning, with the implication that findings from this source could reveal little about the mind or spirit of man, arose in part from the strict Cartesian division between a mechanical body and spiritual mind that was then prevalent (Healy, 1993).

A landmark in the breaking down of this distinction was the appointment of Wilhelm Wundt to a chair of philosophy in Leipzig in 1875. Wundt had previously been a research assistant to Herman von Helmholtz, in which capacity he had done pioneering work on reaction times. This work had been made possible by Helmholtz's work in 1850, which established the rate of transmission along nerve fibres at between 25 to 45 metres per second (Clark and Jacyna, 1989). This, allied to the introduction of the concept of the nervous reflex and a linking of the notion of the reflex to associationist theories of the mind, permitted the hypothesis that computing reaction times to various sensory stimuli might permit an investigation of the structure and localization of psychological functions (Clark and Jacyna, 1989).

By virtue of undertaking such a 'physiological' programme, involving the use of experimental methods, Wundt is generally recognized as the first philosopher to have made the transition to being a psychologist. He opened a laboratory in 1879 (Boakes, 1984) and began training students in psychological research. One of these was Emil Kraepelin.

Kraepelin and pharmacopsychology

In 1883 Kraepelin was studying with Wundt in Leipzig. "Under Wundt's influence, I began to work more on experimental psychological problems. It became increasingly clear to me that this was the field, which particularly interested me and I finally gave up all ideas of working more intensively on anatomical problems. . . . I bought myself a new Hipp Chronoscope . . . and the necessary supplementary machines for my studies on the measurement of mental reactions; I built a rheochord with the nickel silver Wundt had given to me. I planned to expand my tests with drugs, coffee and tea and to measure the mental reactions of psychiatric patients to get a better idea of the mental changes" (Kraepelin, 1987, p. 28).

Later in Heidelberg, "as well as intense clinical research, I encouraged work on experimental psychology. At first, I began to fill in some gaps in my tests on the influence of drugs on intellectual processes, as they had been carried out in Leipzig and Dorpat, and to present them coherently: following these experiments, I held a lecture in Baden-Baden on the central effect of drugs. I equipped 3 small psychological laboratories, obtained the necessary apparatus with the help of the excellent mechanic Runne and gradually tried to interest a couple of people in this scientific work. . . . I realised that if we were to begin psychological tests in psychiatry, we would need different equipment compared to that, which had been used up to now. On the one side, such investigations, which only aimed at the theoretically basic

problems of psychology and especially at the validity of Weber's law did not seem to be very promising. Sensory psychological research was of little interest to us. We not only wanted to identify the behaviour of different mental processes in mental disease but also the external and internal influences. As well as comprehension, the capacity to register, memory, association of ideas, all kinds of intellectual tasks, we particularly wanted to define the manifestations of will, the course of simple movements, the energy output, expressive movements of writing and speech. Finally, it was important to measure the basic qualities of the personality, for example, the capacity to practice, fatigue, practice durability, recovery capacity and distractibility" (Kraepelin, 1987 p. 63).

In 1894 . . . "we continued the studies on the effects of poisons on intellectual processes. Loewald worked on the effects of bromine and Haenel on those of trional, whilst Hoch investigated the effects caused by the different components of tea. Oseretskowsky and Glueck observed the effects of alcohol and caffeine on the ergographic curve and Meyer analysed the effect of alcohol on handwriting. Unfortunately, neither the tests on the effects of tabacco, which had been started time and time again could be finished, nor could the tests with morphium and cocaine" (Kraepelin, 1987 p. 106).

These passages indicate the kind of work that Kraepelin undertook. It appears to have been both experimental and systematic. In 1892, in *Ueber die Beinflussung einfacher psychischer vorgange durch einige arzneimittel*, p. 227, in the following passage he coined the term pharmacopsychology to describe the work he was doing.

"A short look back over the way we have come will show, I believe, that we are now, through the methods used here, in a position to express changes in the inner life of our soul in definite numerical values and to establish very simple elementary disturbances, which otherwise we would only be able to describe in very general outlines through the deceptive art of self-examination. Of course this does not mean that the influences we discover deliver a somehow complete account of the whole psychic effect of that material. On the contrary the opposite can be expected. But the use of these examination methods may also shed light on other aspects of conditions caused by poisoning and in so doing may add to the outlines produced now. Herein lies, it seems to me, a not insignificant benefit of this 'pharmacopsychology', in that it may lead us at times to recognise the true nature of certain psychological processes from the special effects of an already accurately known drug. . . . Following this school of thought, the study of psychic medicines will provide information for psychology".

Despite this very clear statement of principles from Kraepelin, pharmacopsychology did not make significant progress experimentally or institutionally. Jaspers (1963, p. 468) considered that 'hardly any of the results stand up to keen criticism as the relationships are for the most part so complicated". Along with virtually all clinicians, he considered that the significance of the poisons lay in the subjective experiences they provoked but more particularly their lasting after-effects such as change of personality and the induction of psychosis.

Kraepelin's pharmacopsychology remained undeveloped effectively until the 1950s and 1960s when a new generation of drugs, and in particular LSD, stimulated the interest of many to look afresh at the use of drugs to investigate the psyche (Steinberg, 1956). For some, mainly clinicians, the effects of LSD and mescaline were seen as having clear implications for pharmacopsychopathology (see Hoffer p. C19 and Hoch p. C20 in Malitz, 1990; Hoffer, Osmond and Smythies, 1954; Hoch, Catell and Pennes, 1952; Elkes, Elkes and Bradley, 1954; Mayer-Gross, 1951). For others, and in particular a number of experimental psychologists, the effects of LSD and other psychotropic agents were seen in a light much closer to that which had caught the imagination of Kraepelin (McKellar, 1989; Claridge, 1969; Russell, 1961, 1987; Gregory, 1989).

This latter approach has not been developed in any systematic way, except perhaps for studies on human volunteers using cholinergic drugs to explore human information processing (Warburton and Wesnes, 1984). The lack of development may owe something to the proscription of LSD as well as to the dominance of behaviourism in psychology with its proscription of introspection.

A further reason for this lack of development, however, must be because the discovery of new drugs and the demonstration of clinical efficacy understandably led to an emphasis on therapeutics and clinical pharmacology in the first instance. There was also a tremendous stimulus to neurobiology in an attempt to establish how these new agents worked in order to be able to predict their effects more precisely and to assist in the tailoring of new and better compounds.

These latter approaches, with their emphasis on dosage regimes, plasma levels, receptor binding and enzyme inhibition, have formed the bulk of what is now known as psychopharmacology. This inversion of Kraepelin's original term perhaps suggests that an emphasis on the operations of the psyche has, to some extent, been lost sight of. More recently, with the recognition of the phenomenon of awareness under anaesthesia and with increasing interest in the question of consciousness (Healy, 1992), it may be that pharmacopsychology will reemerge.

The institutional scaffolding of psychopharmacology

Psychopharmacology and the CINP

What work there had been on the poisons prior to World War II did not give rise to any organizational developments. All of this changed in the late 1950s. The explosive development of psychopharmacology since the early 1950s is generally thought of as being triggered by two major discoveries: the psychotomimetic effects of LSD in 1943 and the therapeutic effects of chlorpromazine in 1952 (Ban and Hippius, 1989). The possibilities of inducing psychopathology by the administration of pharmacological agents and of controlling naturally occurring disease processes by the use of drugs opened unforeseen possibilities for brain research and psychiatry.

In his opening address to the first CINP congress in Rome in 1958, Rothlin pointed out that these discoveries, as well as having revolutionary consequences in the treatment of psychotic patients, gave a great impetus to a scientific approach to brain research. The incentive they provided "was not limited to the theoretical or practical medical sciences but caused an even greater stimulus to the imagination of chemists leading to the production of new compounds with a speed that neither the pharmacological, biochemical nor clinical investigations could equitably follow" (Ban and Hippius, 1989).

However, equally important may well have been the development of an organizational scaffolding for the 'new' science. A number of workers recognized that an essential prerequisite for further development was an organization which could provide a forum for the exchange of information and which would thereby facilitate communication among the different disciplines involved.

The need for an international collegium in neuropsychopharmacology was, it seems, first expressed during a symposium on psychotropic drugs, organized by Professor Trabucchi in Milan in the spring of 1957. To put things in a proper historical prospective, at the time of this informal session of the founding members in Milan, there were only a few neuroleptics in clinical use and the antidepressant properties of imipramine were still not discovered. Furthermore, there were only a few psychopharmacologists around the world. However, it is the impression of some of the early workers in the field that somewhere between the spring of 1957 and the autumn of 1958 there was a rapid increase of interest in psychopharmacology and in the numbers of neuropsychopharmacologists (Deniker, 1989; Radouco-Thomas, 1989).

While the idea of the college was mooted at the Milan meeting, the inauguration was postponed to the second world congress of Psychiatry held in Zurich in September 1957. At this congress Professor Rothlin invited leading neuropsychopharmacologists from different countries to a dinner at the Bahnhoffs-buffet. At this, the CINP was officially formed, an executive committee was elected and an invitation from Professor Trabucchi to hold the first meeting of the collegium in Rome was accepted (Deniker, 1989; Radouco-Thomas, 1989).

The founding members of the CINP were Brill, Brodie, Cameron, Denber and Klein from the United States, as well as Bradley, Lewis, Rees and Shepherd from Great Britain, along with Arnold, Baruk, Booij, Bovet, Delay, Deniker, Faurbye, Flugel, Gozzano, Hippius, Hoff, Hoffer, Van der Horst, Laborit, Odegard, Radouco-Thomas, Van Rhyn, Rothlin, Stoll, Thuillier and Trabucchi from Europe and Delgado from Peru (Ban and Hippius, 1992). It can be seen, from this list, that initially the organization was predominantly European.

One version of what happened has it that the first steps toward the organization of the collegium were taken by Dr. Da Boor from the University of Cologne and Dr. Corneille Radouco-Thomas from the University of Geneva (Radouco-Thomas, 1989). Another version (Ayd, in Malitz, 1990 p. A-29) was that Denber was the prime mover in formulating the idea of an international collegium and in setting up the organizational meeting. Ayd (Malitz, 1990) suggested that "personalities got into this . . . some of the founding fathers of the group were excluded and the ones who were excluded objected".

According to Radouco-Thomas (1989), the local organizing committee for the first meeting of the CINP was chaired by Professor Trabucchi from Milan. The first meeting was held in Rome in September of 1958. The central themes of the four symposia organized were abnormal behavioural states induced by psychotropic drugs in animals and man with a focus on methodology and on the comparison of drug-induced psychopathological changes and the psychopathology of the endogenous psychoses. Speakers were split on questions of the usefulness of pre-clinical research on animals and on the extent to which model psychoses in man mirrored the endogenous psychoses (Radouco-Thomas, 1989).

Some of the earliest information was presented on the drug treatment of schizophrenic disorders with phenothiazine neuroleptics and on the drug treatment of affective disorders with MAO inhibitors, tricyclic antidepressants and lithium salts.

In the opinion of Radouco-Thomas, the people most responsible for creating neuropsychopharmacology were Philip Bradley, Herman Denber, Pierre Deniker, W. Da Boor, Joel Elkes, Sylvio Garattini, Ernest Rothlin, W. Stoll and Emilio Trabucchi. In his opinion, a second generation of neuropsychopharmacologists helped to consolidate these gains; this group included Thomas Ban, Jonathan Cole, Emilio Costa, Jean Delay, Leo Hollister, Hans Hippius, Paul Janssen, Paul Kielholz, Hans Lehmann and Ole Rafaelsen (Radouco-Thomas, 1989).

Delegates to the congress in Rome had a special reception with Pope Pius XII (1958). At this the Pope gave a speech about psychopharmacology, in which he confirmed that it was permissible to give analgesic drugs for the alleviation of sufferings in dying patients (Deniker, 1989). If this were all that had been said, this speech could perhaps be seen as symbolically closing an era begun with the development of the anaesthetics, which generated a set of tensions that were crystallized by the controversy following Queen Victoria's use of chloroform during labour (Pernick, 1985). It was these tensions that underpinned the idea that 'poisons' could not be expected to reveal much of the normal operations of the psyche. However, the Pope remained concerned about the question of consent given by experimental subjects, whether healthy volunteers or patients, in studies involving the taking of psychotropic drugs to alter cognitive function (Pius XII, 1958).

Following the Rome congress, there has been a programme of biennial congresses in place ever since with subsequent congresses taking place in Basle, Munich, Birmingham, Washington, Tarragona, Prague, Copenhagen, Paris, Quebec, Vienna, Gottenberg, Jerusalem, Florence, San Juan, Munich, Kyoto and, most recently, Nice.

In a short piece on the second CINP congress in Basle, Denber (1989) noted that mescaline and LSD were a focus of intensive effort. However, he also noted that there remained many who felt that the effects of psychotropic drugs were non-specific. This led to a symposium on the implications of and importance of social and familial factors in psychiatric illness. Another was dedicated to the question of understanding the biochemical mechanism of action of drugs, as without this it was felt that the subject would remain entirely empirical. A further symposium was devoted to the question of the conditioned response and the effects of drugs upon this, as exploiting this response was central to the approach of many pharmacologists and psychologists.

A very similar set of symposia was held in Munich in 1962, with an additional symposium '10 Years of Psychopharmacology: critical assessment of the present and future' (Arnold, 1989), and in Birmingham in 1964 (Bradley, 1989).

Reviewing the Washington congress in 1966, Joel Elkes quoted from a paper he had read as president of the American College of Neuropsychopharmacology (ACNP) in 1962, claiming that psychopharmacology had "in a mere decade, questioned the concepts of synaptic transmission in the central nervous system . . . . given us tools for the study of the chemical basis of learning and temporary connection formation, ... emphasised the dependence of pharmacological response on its situational and social setting . . . . compelled a hard look at the semantics of psychiatric diagnosis, description and communication . . . resuscitated that oldest of old remedies, the placebo response for careful scrutiny and encouraged the biochemist, physiologist, psychologist, clinician, mathematician and communication engineer to join forces at the bench level. . . . Psychopharmacology is . . . ., for the first time, compelling the physical and chemical sciences to look at behaviour in the face and thus enriching both these sciences and behaviour" (Elkes, 1989).

As of 1988, there were 11 national or regional psychopharmacological societies. In order of founding these were the Czechoslovakian (1958), Scandinavian (1959), German (1960), and the American (1960) societies, with a later wave in the 1970s in Japan (1970), Britain (1974) and Canada (1977). There are also societies in Argentina, Brazil, Italy and Korea and a European College of Neuropsychopharmacology was established in 1985.

American College of Neuropsychopharmacology (ACNP)

Writing in Thirty years CINP, Levine, discussing the role of the CINP in US Psychopharmacology, suggested that it has been less important in the US than in Europe (Levine, 1989). The reason for this he put down to the parallel development of the prestigious and effective American College of Neuropsychopharmacology (ACNP) with its highly regarded annual meetings and publications. Likewise the existence of the NIMH Psychopharmacology programme with its early clinical drug evaluation units and biennial meetings, where clinical investigators shared views on new therapeutic compounds and research methodology, overlapped to some extent with the activities of the CINP.

The ACNP was founded at a meeting entitled 'Conference on the Advancement of Neuropsychopharmacology' held at the Barbizon Plaza hotel New York on November 12th and 13th, 1960 (Malitz, 1960/1990). This was organized primarily by Theodore Rothman. In the course of the 2-day meeting, Rothman noted that the formation of organizations, to raise standards and values, through which new sciences regulate themselves, is always an important step in the history of a science (Malitz, 1990, p. A-21). In part, the impetus to form the ACNP came because of dissatisfaction with the already existing CINP, which at this stage had already had its Rome and Basle meetings (see Brodie p. A-27 in Malitz, 1990).

This dissatisfaction had something to do with the fact that most CINP members were not English speaking (Ayd, p. A-29 in Malitz, 1990) but must also have had a great deal to do with the fact that the majority of the larger pharmaceutical companies had their headquarters in the US and a great deal of both the clinical and experimental work in neuropsychopharmacology was then happening in the US.

At the foundation meeting, a considerable length of time was spent discussing the quality of information provided by pharmaceutical companies to clinicians regarding new compounds, the need for education of psychiatric trainees and general practitioners about the proper use of psychotropic agents and the difficulties posed by the need for multidisciplinary inputs to research on the new compounds. There was also a review of the contemporary state of knowledge regarding the mechanism of action of psychotropic compounds. The meeting then voted to form a college and elected Drs Rothman, Hoch, Ayd, Cole, Feldman and Brodie as its organizing committee.

The consensus at the initial meeting appeared to be that any future organization would be an open one, but the ACNP as it has evolved has been a closed group, with a relatively small (currently 300 plus) membership. It has attempted to be a regulatory and educational forum, with the ACNP handbook providing statements on matters such as conflict of interest for clinical investigators and groups within the college having put together a model psychopharmacology curriculum (Glick *et al.*, 1984).

British Association for Psychopharmacology (BAP)

Some of the tensions inherent in psychopharmacology/pharmacopsychology apparent at the founding of the ACNP were further in evidence with the founding of the BAP. There was, furthermore, tension between clinical psychopharmacologists and clinicians and between both of these groupings and those from the basic sciences disciplines that feed into psychopharmacology and between all of these and the pharmaceutical industry that interfaces with this hybrid science.

The initial move to establish what was later to be the BAP came from Tony Hordern who outlined his ideas in the first instance to Sydney Brandon and David Wheatley and found that there had been a number of other clinicians including David Wheatley and Alec Coppen thinking this way for some time. The early impetus for such an organization came from a concern that neither the pharmacology of the newer drugs nor the methodology of clinical trials was understood adequately by many clinicians who were getting involved in clinical trial work. It was hoped to create a forum in which clinicians, basic scientists and both scientists and other members of the pharmaceutical industry could get to grips with the issues in a spirit of enquiry. A letter, drafted by David Wheatley and posted on February 15th 1974, was sent to the *British Medical Journal*, the *Lancet* and the *British Journal of Psychiatry*, signed by Sydney Brandon, Alec Coppen, Max Hamilton, Michael Holden, Anthony Hordern, Norman Imlah, Alec Jenner, David Shaw and David Wheatley (Brandon *et al.*, 1974a,b,c). The letter notes that despite "considerable contributions made by our country to psychopharmacology" the UK was in an anomalous position vis-a-vis other countries, in particular the US, in not having a national psychopharmacology organization. It was suggested that an Academy would further both clinical and experimental research in psychopharmacology, improve the standards of psychotropic drug evaluation, and have a policy in relation to the pharmaceutical industry.

This statement of intent led to a formal meeting in the Royal Society of Medicine on July 2nd 1974, at which Max Hamilton was elected chairman of the nascent British Academy of Psychopharmacology. Within weeks of the publication of the letter there had been 70 replies, rising to 118 by November, which led the organizers to believe that they were meeting a commonly perceived need.

However, considerable misgivings were expressed by a number of other prominent psychopharmacologists, including P. Bradley, T. Crow, M. Lader, R. Kumar and I. Stollerman, regarding the structure and nature of the new organization. There was opposition from clinicians, who argued that clinical scientists should join the relevant properly scientific societies such as the Physiological Society or the Pharmacological Society, for instance. Otherwise, it was argued, a division would appear between clinicians and basic scientists, in what was from its earliest stages being seen as a clinicians society.

Misgivings were also expressed by many at the lack of formal representation of all the disciplines involved in neuropsychopharmacology, as well as at the proposal for restricted membership of the society on the lines of the ACNP, which it was thought would limit the involvement of younger scientists. There was concern at what was perceived to be a hidden agenda on the part of clinicians to secure any pharmaceutical industry funds for research. The issue of industry participation in the association caused particular dispute.

Opponents of the 'Academy' were also able to muster over 100 supporters. Their opposition led to an open meeting at the Royal Society of Medicine on November 23rd 1974, at which it was suggested that a Steering Committee be set up to look into the constitution of the society. Work on a constitution proceeded and this was adopted at the annual general meeting in 1976, at which point the Academy became the British Association for Psychopharmacology. George Beaumont, then working with Ciba-Geigy, was the principal author of this constitution, which sought to balance the various interests participant in the BAP—from neuropsychopharmacologists working with animals to clinical psychopharmacologists, experimental psychologists, both those working with animals and those working in clinical settings, biochemical pharmacologists, neurochemists, clinical psychiatrists and members of the

pharmaceutical industry. His constitution aimed at ensuring that all of these interests were represented on a central council and that the offices of the society could be held for a limited period only and should rotate between the different disciplines.

While this constitution undoubtedly helped, some of the original tensions surfaced again in 1984, when it was proposed to hold the annual meeting in Guernsey at the St Pierre Park Hotel. This, it was felt by some, typified what was wrong with the association, in that the costs of travel and accommodation would militate against the involvement of junior workers. The debate surrounding this meeting led to a proposal to hold future annual meetings at accessible, inexpensive and 'interest-neutral' venues such as the university campus at Cambridge. This approach has perhaps contributed to the BAP's becoming (as of 1992) the largest national psychopharmacology association.

To date, the presidents of the BAP, in succession to Max Hamilton, have been Alec Coppen, Philip Bradley, Merton Sandler, Gene Paykel, Susan Iversen, Malcolm Lader, Brian Leonard, Stuart Montgomery and Barry Everitt. An association journal, the *Journal of Psychopharmacology*, was started in 1987, which is currently edited by David Nutt.

European College of Neuropsychopharmacology (ECNP)

The idea for the founding of a European Association for Neuropsychopharmacology came from Per Bech and C. Gottfries. It was developed at the 25th anniversary meeting of the Scandinavian Society for Psychopharmacology, held at the Hotel Scandinavia in Copenhagen on 15th and 16th March 1984 (Bech, 1984). This meeting had a 25th anniversary symposium in which the current scope of psychopharmacological research in Scandinavia was discussed by Gottfries (1984), in the United Kingdom by Trimble and Paykel (1984), in Switzerland by Gastpar (1984), in Italy by Cassano and Deltito (1984), in Holland by Verhoeven (1984) and in Spain by Ballus (1984).

This led to a first meeting of the Association of Psychopharmacologists in Europe organized in Copenhagen in May of 1985. The announcement of this meeting in the first instance was only made to members of existing European associations for psychopharmacology and this was organized through members of the working group. This led to problems and, in particular, to the under-representation of a number of national associations, including the Polish, Portuguese and Greek (Bech, 1986). In total, 120 delegates attended. The name ECNP was adopted. A preliminary constitution was developed in great part through the efforts of Max Hamilton. This was accepted in Brussels in 1987 and it led to a final constitution, which was accepted in Gothenberg in 1989.

The initial working group established to prepare the constitution consisted of Ballus (E), Bech and Gram (DK), Cassano and Racagni (I), Delini-Stula, Gastpar and Kielholz (CH), Gottfries (S), Hamilton and Trimble (UK), Mendlewicz (B), Ruther (G), Verhoeven and Wakelin (NL) and Zarifian (F). Congresses have been organized subsequently in Brussels in 1987, Gothenberg (1989), Monte Carlo (1991), Marbella (1992) and projected for Budapest in 1993. At the Monte Carlo meeting, held in the Hotel Loews Conference Centre, some of the tensions regarding conference venue and accessibility of the ECNP to younger researchers, that had emerged in the BAP around the 1984 meeting, were again in evidence.

European Neuropsychopharmacology has recently become established as the College's journal.

Discussion

In any discussion of the philosophy and history of science the paradigmatic science that is cited is usually physics. Development in physics, and accordingly in the rest of science, is often held to happen by a process of conjecture and refutation. This process, it is often argued, should be pursued even if it involves 'pure' research aimed at answering what may appear to be esoteric questions, regardless of whether or not the exercise seems likely to be profitable. This purist model of scientific development, it has been argued, obscures the extent to which development in physics and other sciences has come about in response to technical developments (Healy, 1990a). In sciences such as biochemistry and pharmacology, it is clear that a very different dynamic pertains. In these disciplines, technical developments regularly give rise to a range of unexpected observations and phenomena that theories have subsequently to scramble to accommodate. However, while technical developments may, in these cases, give rise to scientific advance, they also commonly involve developments which are commercially exploitable.

In the case of psychopharmacology, furthermore, this exploitation interfaces with the practice of medicine. If psychopharmacology offers a different model of scientific development to the popular purist models, so also it brings into perspective aspects of medicine that are commonly left out of popular myths. Medicine, in addition to being an art, and increasingly an arena for the articulation of cultural and political values (Bury and Gabe, 1990; Gabe and Bury, 1991; Fierlbeck, 1991), has always been a business. This latter aspect, however, is invariably factored out of any discussion of medical science (Porter and Porter, 1989; Healy, 1990b).

Finally as Joel Elkes (Elkes, 1989) pointed out, psychopharmacology potentially brings into perspective some of the most intimate aspects of human nature.

Public concern regarding Queen Victoria's use of anaesthesia through to the use of analgesia in chronic care helps to bring this point home. But, in addition, it can be argued that psychology, more than any other discipline, has been imprisoned by the model of scientific advance stemming from physics and this has stultified developments (Healy, 1990a, 1993). Kraepelin offered a way forward with his pharmacopsychology but psychologists have been particularly wary, it would seem, of involvement with drugs either experimentally or therapeutically.

This, and the other tensions noted above, has played a critical part in the shaping of developments in psychopharmacology. The faultlines within the broad church that is psychopharmacology can sometimes be glimpsed in the records of the foundation of some of its institutional associations. There is, for example, the question of hotels, which have featured prominently in the establishment and politics of all the associations. The foundation of each of the associations appears also to have led to some groups perceiving themselves as excluded—has there been anything common to these groupings? Are these faultlines determined by the larger organization of medicine within national communities? In the United Kingdom, for example, there is a clear divide between general and hospital practices (Honigsbaum, 1979), across which hostility often develops and has done so regarding psychotropic drug prescribing (Gabe and Bury, 1991). Hostilities surrounding the foundation of the BAP may have had something to do with this; there was considerable general practitioner and general psychiatry input into its foundation and the opposition came from the centres of research excellence, in particular the Maudsley. For all these reasons, the historical development of psychopharmacology bears close scrutiny.

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References

Arnold O H (1989) The 3rd Congress—Munich 1962. In Ban T A, Hippius H (eds), Thirty years CINP. A brief history of the Collegium Internationale Neuro-psychopharmacologium. Springer-Verlag, New York, pp. 12-13

Ballus C (1984) Psychopharmacology in Spain. Nord Psychiatr Tidsskr *Suppl 10*: 44

Ban T A, Hippius H (1989) Thirty years CINP. A brief history of the Collegium Internationale Neuro-psychopharmacologium. Springer-Verlag, New York

Ban T A, Hippius H (1992) Psychopharmacology in perspective. Springer-Verlag, New York

Baruk H (1992) Personal account. In Ban T A, Hippius H (eds) Psychopharmacology in perspective. Springer-Verlag, New York, pp. 40-41

Bech P (1984) Scandinavian Association of Psychopharmacology 1959-1984. Nord Psychiatr Tidsskr *Suppl 10*: 3

Bech P (1986) European College of Neuropsychopharmacology. Pharmacopsychiatry *19*: 1

Boakes R (1984) From Darwin to behaviourism. Cambridge University Press, Cambridge

Bradley P B (1989) The 4th Congress—Birmingham 1964. In Ban T A, Hippius H (eds), Thirty years CINP. A brief history of the Collegium Internationale Neuro-psychopharmacologium. Springer-Verlag, New York, pp. 14-16

Brandon S, Coppen A, Hamilton M, Holden M, Hordern A, Imlah N, Jenner A, Shaw D, Wheatley D (1974a). British Academy of Psychopharmacology. Br Med J *2*: 391

Brandon S, Coppen A, Hamilton M, Holden M, Hordern A, Imlah N, Jenner A, Shaw D, Wheatley D (1974b) British Academy of Psychopharmacology. Lancet *i*: 367

Brandon S, Coppen A, Hamilton M, Holden M, Hordern A, Imlah N, Jenner A, Shaw D, Wheatley D (1974c) British Academy of Psychopharmacology. Br J Psychiatr *124*: 508

Bury M, Gabe J (1990) Hooked? Media responses to tranquilizer dependence. In Abbott P, Payne G (eds), New directions in the sociology of health and illness. Falmer Press, Lewes, pp. 86-103

Carlsson A (1990) Early psychopharmacology and the rise of modern brain research. J Psychopharmacol *4*: 120-126

Cassano G B, Deltito J A (1984) Psychopharmacology in Italy: a perspective. Nord Psychiatr Tidsskr *Suppl 10*: 39-42

Claridge G (1969) Drugs and human behaviour. Pelican Books, Harmondsworth, Middlesex

Clark E, Jacyna L S (1989) The nineteenth century origin of neuroscientific concepts. University of California Press, Berkeley

Denber H C B (1989) The 2nd Congress—Basle 1960. In Ban T A, Hippius H (eds), Thirty years CINP. A brief history of the Collegium Internationale Neuro-psychopharmacologium. Springer-Verlag, New York, pp. 10-11

Deniker P (1989) The 10th Congress—Quebec 1976. In Ban T A, Hippius H (eds), Thirty years CINP. A brief history of the Collegium Internationale Neuro-psychopharmacologium. Springer-Verlag, New York, pp. 34-36

Elkes J (1989) The 5th Congress—Washington 1966. In Ban T A, Hippius H (eds), Thirty years CINP. A brief history of the Collegium Internationale Neuro-pscyhopharmacologium. Springer-Verlag, New York, pp. 17-19

Elkes J, Elkes C, Bradley P (1954) The effect of some drugs on the electrical activity of the brain and on behaviour. J Ment Sci *100*: 125-128

Fierlbeck K (1991) Redefining responsibility: The politics of citizenship in the United Kingdom. Can J Political Sci *24*: 575-593

Gabe J, Bury M (1991) Tranquilizers and health care in crisis. Social Sci Med *32*: 449-454

Gastpar M (1984) The current scope of psychopharmacological research in Switzerland. Nord Psychiatr Tidsskr *Suppl 10*: 35-38

Glick I D, Janowsky D S, Salzman C, Shader R I (1984) A model psychopharmacology curriculum for psychiatric residents. Copyright ACNP

Gottfries C G (1984) The Scandinavian Association of Psychopharmacology—25 years. Nord Psychiatr Tidsskr *Suppl 10*: 29-32

Gregory R (1989) Consciousness in science and philosophy. In Marcel A J, Bisiach E (eds), Consciousness and contemporary science. Oxford University Press, Oxford, pp. 257-272

Healy D (1990a) The suspended revolution. Faber and Faber, London

Healy D (1990b) The psychopharmacological era: notes toward a history. J Psychopharmacol *4*: 152-167

Healy D (1992) Altered states of consciousness: phenomenology and pharmacology. J Psychopharmacol *6*: 425-435

Healy D (1993) Images of trauma. Faber & Faber, London

Hoch P H, Catell J P, Pennes H H (1952) Effects of mescaline and lysergic acid. Am J Psychiatr *108*: 579-589

Hoffer A, Osmond H, Smythies J (1954) Schizophrenia: a new approach. J Ment Sci *100*: 29-45

Honigsbaum F (1979) The division of British medicine: a history of the separation of general practice from hospital care 1911-1968. Kogan Page, London

James W (1902) The varieties of religious experience. Penguin Books, Harmondsworth, Middlesex

Jaspers K (1963) General psychopathology. Translated from the German, *Allgemeine Psychopathologie*, First Edition 1913, by Hoenig S, Hamilton M W. Manchester University Press, Manchester

Kraepelin E (1892) Ueber die Beinflussing einfacher psychischer vorgange durch einige arzneimittel. Varlagg von Gustav Fischer, Jena

Kraepelin E (1987) Memoirs. Translated by Cheryl Wooding-Deane, Springer Verlag, New York

Levine J (1989) Americas—United States. In Ban T A, Hippius H (eds), Thirty years CINP. A brief history of the Collegium Internationale Neuro-psychopharmacologium. Springer-Verlag, New York, pp. 74-76

Malitz S (1960/1990) In the beginning . . The origin of the American College of Neuropsychopharmacology. Copyright American College of Neuropsychopharmacology.

Maudsley H (1897) Natural causes and supernatural seemings. Kegan Paul, Trench Trubner & Co., London

Mayer-Gross W (1951) Experimental psychoses and other mental abnormalities produced by drugs. Br Med J *ii*: 317-321

McKellar P (1989) Abnormal psychology. Routledge and Kegan Paul

Moreau de Tours J (1845) Du Hachisch et de l'alienation mentale

Pernick M S (1985) A calculus of suffering: pain, professionalism and anaesthesia in nineteenth century America. Columbia University Press, New York.

Pius XII, Pope (1958) Lis qui interfuerunt Conventui internationali, Romanae habito, a Collegio Internationali Neuro-Psycho-Pharmacologico indicto. Acta Apostolica Sedis XXV, pp. 687-696

Porter R, Porter D (1989) The rise of the English drugs industry; the role of Thomas Corbyn. Med History *33*: 277-295

Radouco-Thomas C (1989) The 1st Congress—Rome 1958. In Ban T A, Hippius H (eds), Thirty years CINP. A brief history of the Collegium Internationale Neuropsychopharmacologium. Springer-Verlag, New York, pp. 5-9

Russell R W (1961) Drugs as research tools in behavioural research. In Uhr L, Miller J G (eds), Drugs and behaviour. Wiley, New York, pp. 19-40

Russell R W (1987) Drugs as tools for research in neuropsychobiology: A historical perspective. Neuropsychobiology *18*: 134-143

Steinberg H (1956) 'Abnormal Behaviour' induced by nitrous oxide. Br J Psychol *47*: 183-194

Trimble M R, Paykel E S (1984) The current scope of psychopharmacology research in the UK. Nord Psychiatr Tidsskr *Suppl 10*: 33-34

Verhoeven W M A (1984) Research in biological psychiatry in the Netherlands; a brief survey. Nord Psychiatr Tidsskr *Suppl 10*: 43

Warburton D W, Wesnes K (1984) Drugs as research tools in psychology: cholinergic drugs and information processing. Neuropsychobiology *11*: 121-132