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Feature Article

NEUROCHEMICAL SELVES

Nikolas Rose

How did we become neurochemical selves? How did we come to think about our sadness as a condition called "depression" caused by a chemical imbalance in the brain and amenable to treatment by drugs that would "rebalance" these chemicals? How did we come to experience our worries at home and at work as "generalized anxiety disorder" also caused by a chemical imbalance which can be corrected by drugs? How did we-or at least those of us who live in the United States come to code children's inattentiveness, difficulties with organizing tasks, fidgetiness, squirming, excessive talkativity and noisiness, impatience and the like as Attention Deficit Hyperactivity Disorder (ADHD) treatable by amphetamines? How did some of us come to understand changes in mood in the last week of the menstrual cycle-depressed mood, anxiety, emotional lability and decreased interest in activities-as premenstrual dysphoric disorder, treatable with a smaller dose of the very same drug that has become so popular in the treatment of "depression" - fluoxetine hydrochloride?

Perhaps some names give a clue. Depression: not so much fluoxetine hydrochloride as Prozac. Generalized Anxiety Disorder: not so much paroxetine as Paxil. ADHD: not methylphenidate or amphetamine/dextroamphetamine but Ritalin and Adderall. Premenstrual dysphoric disorder: not so much fluoxetine hydrochloride (again) but Sarafem. And some more names: Prozac and Sarafem: Eli Lilly. Paxil: GlaxoSmithKline. Ritalin: Novartis (Ciba Geigy). Adderall: Shire-Richmond. In this essay I want to explore the linkages between the reframing of the self, the emergence of these conditions, the development of these drugs, the marketing of these brands, and the strategies of the pharmaceutical companies.

These do not just reshape our ways of thinking about and acting upon disorders of thought, mood and conduct. Of course, they have enormous consequences for psychiatry as it is practiced in the psychiatric hospital, for the "community psychiatric patient," and in the doctors' surgery. But they

have also had an impact on the workplace and the school, the family and the prison-not to mention the bedroom and the sports field. And this recoding of everyday affects and conducts in terms of their neurochemistry is only one element of a more widespread mutation in which we in the West, most especially in the United States, have come to understand our minds and selves in terms of our brains and bodies.

I have started with neurochemistry: the belief that variations in neurochemistry underlie variations in thought, mood and behavior, and that these can be modulated with drugs. I might have started with brain imaging: the belief that it is now possible to visualize the activities of the living brain as it thinks, desires, feels happy or sad, loves and fears, and hence to distinguish normality from abnormality at the level of patterns of brain activity. Or I might have started with genomics: claims to have mapped precise sequences of bases in specific chromosomal regions that affect our variations in mood, capacity to control our impulses, the types of mental illness we are susceptible to and our personality. But here, I want to start with the pharmaceuticals themselves.

Psychopharmacological Societies

Over the last half of the twentieth century, health care practices in developed, liberal, and democratic societies, notably Europe and the United States, became increasingly dependent on commercially produced pharmaceuticals. This is especially true in relation to psychiatry and mental health. We could term these "psychopharmacological" societies. They are societies where the modification of thought, mood and conduct by pharmacological means has become more or less routine. In such societies, in many different contexts, in different ways, in relation to a variety of problems, by doctors, psychiatrists, parents and by ourselves, human subjective capacities have come to be routinely re-shaped by psychiatric drugs.

While attempts at chemical solutions to psychiatric problems have a long history, the modern era

begins in the 1950s, for it was at this point that drugs were formulated and marketed that were not merely sedative but claimed to have a specific effect on particular symptoms of certain psychiatric conditions. It is well known that the first widely used psychiatric drug was chlorpromazine, developed from antihistamines by company scientists at the pharmaceutical firm Rhone-Poulenc in the years after the Second World War. Two French psychiatrists, Pierre Deniker and Jean Delay, who administered it to a group of psychotically agitated patients at the Hôpital Sainte-Anne in Paris in 1952, are credited with the discovery of its psychiatric effects. It was taken by Rhone-Poulenc to Canada, and licensed to Smith Kline and French who promoted it heavily in the United States under the name of Thorazine where it spread rapidly through the crowded psychiatric hospitals making them \$75 million in 1955 alone. It was thought not to be a sedative like barbiturates or chloral, but to act specifically on the symptoms of mental illness. Nonetheless, up to the late 1960s, most psychiatrists thought of it as a general "tranquillizer." It was followed by the development of drugs specifically claiming to treat depression and named "anti-depressants": Geigy's imipramine (Tofranil) was tested by Ronald Kuhn at the Munsterlingen Hospital near Konstanz during the early 1950s and despite the initial lack of enthusiasm-depression was not seen, at that time, as a major psychiatric problem - Tofranil was launched in 1958 and became established as the first "tricyclic" anti-depressant in 1960s-so-called because of its three-ringed chemical structure. It was followed by Merck's tricyclic, amitryptiline (Elavil) in 1961. Over the same period, other drug companies and psychiatrists were experimenting with other drugs-reserpine, isoniazid, iproniazid (Marsalid)-which would eventually give rise to the influential "serotonin hypothesis of depression" so crucial for the fabrication and marketing of Prozac and its sisters. It was also in the 1950s that the pharmaceutical companies developed and marketed drugs for the stresses and strains of everyday life-the compounds that became known as "tranquillizers."

Accurate comparative and historical data on psychiatric drug prescribing since the 1950s is not readily available. But some can be found in published sources, and some more is available from commercial organizations that monitor the pharmaceutical industry, notably from the leading organization monitoring the pharmaceutical industry, IMS Health. In this paper, I draw upon different sources of evi-

dence to illustrate some general trends and patterns. While the interpretation of the detailed figures is subject to many qualifications, and actual numbers should be regarded simply as indicative, they are sufficiently robust for these purposes.

Over the decade from 1990 to 2000, the growth in the value of sales of psychiatric drugs is constant, yet uneven in different regions of the world. Of course, data on medications obtained on a prescription basis are obviously rather limited, as they show prescribing practices rather than consumption practices and we know that consumers often do not take all, or any, of the drugs they are prescribed. And aggregated data conceals significant variations.

However, these data do show trends in the market over this decade. In South America it has grown around 200%, in South Africa over 50%, and in Pakistan over 130%. In the "more developed" regions, Japan has grown by almost 50% from an initially low base level of sales; in Europe, from a relatively high base, growth has been over 125%; and growth in the value of sales in the United States been over 600%. Within these regions, the value of psychiatric drugs dispensed at pharmacies and hospitals as a proportion of total drugs dispensed in this way varies greatly. At the end of the decade in the United States, sales of prescribed psychiatric drugs amounted to almost \$19 billion-almost 18% of a total pharmaceutical market of \$107 billion, while the market in Japan, at \$1.36 billion, amounted to less than 3% of a total pharmaceutical market of \$49.1 billion.

Of course, these data on the market for prescription drugs and its growth are affected by the relative costs of the drugs, pricing decisions of manufacturers for particular regions, financial regimes in operation in different national health services, and the availability of certain medications on a nonprescription, over-the-counter basis. Hence financial data does not accurately represent changes in the rates of prescribing of these psychiatric drugs. A better indication of this is trends in terms of standard dosage units.

These data show that the rising trend in prescription of psychiatric medication from 1990 to 2000 is less marked when measured in standard dosage units. In the more developed regions, the United States shows a growth of 70.1 %; Europe shows a growth of 40.4%; and Japan shows a growth of 30.9%. In the less developed regions, South America remains remarkably constant with a growth of only 1.6%, South Africa shows a growth of 13.1 %, but the use of prescription drugs in Pakistan grows by 33.4% (although from a low base).

This variation in the quantity of drugs prescribed is instructive, but we see a rather different pattern when we relate the number of standard doses prescribed to the size of the population in each region. These figures for the year 2000 show that the annual rates of prescribing psychiatric drugs are actually remarkably similar in the more developed regions-the United States, Europe and Japan-at an average of around 6.5 million standard doses per 100,000 persons. Similarly, the rate of prescribing in the three less developed regions is roughly similar, although it stands at around 12% of that in the more developed regions, or around 750, 000 standard doses per 100,000 persons. However, within these figures, there are significant regional variations in the proportions of different classes of psychiatric drugs being prescribed. In the United States, anti-depressants form a much higher proportion of psychiatric drugs than any other region, and antipsychotics, hypnotics and sedatives are proportionally low. High proportions of tranquillizer prescribing are shown in Japan, South America and Pakistan, with correlatively low levels of anti-depressant prescriptions. The US is the only region where psychostimulants such as methylphenidate and amphetamine are a significant proportion of the psychiatric drug market, amounting to almost 10% in 2000.

What accounts for the high rates of prescribing psychiatric drugs in the "more developed" regions of Europe, Japan and the United States? And how can the variations in the prescribing of different classes of drugs be explained? In Europe and the United States, the context has been the fundamental transformation of the locus of psychiatric care from the closed world of the asylum to an open psychiatric system. But many specifically pharmaceutical issues have played a key role. The marketing strategies of the companies, the licensing regimes in force in different regions, the availability of over-the-counter medication which does not show in this prescribing data, the relative costs of the drugs and the funding regimes in place, the beliefs of the medical and psychiatric professionals and the demands of the patients and lay public have all played their part. The consequence has been a fundamental shift in the distinctions and relations between mental and psychological health and illness, perhaps even conceptions of personhood itself.

The United Kingdom

Before considering these issues, it is worth pausing to examine the prescribing data in more detail. Thus, for instance, in the UK, between 1960 (when

the average number of inpatients in psychiatric hospitals was around 130,000) and 1980 (when this figure had almost halved to around 70,000) the major growth in the psychiatric drug market was in the use of tranquillizers (both major and minor) --- from around 6 million prescriptions per year to around 24 million.

Over the following twenty years, the total number of prescription items dispensed in the four main classes of drug used for psychiatric conditions - hypnotics and anxiolytics, anti-psychotics (a re-classification of drugs previously classified as "major tranquillizers" linked to beliefs about their specificity of action) and anti-depressants and stimulants, rose from about 34.5 million items to about 44.5 million-a growth of almost 30%. A decline in prescriptions for hypnotics and anxiolytics of about 32% (from about 24.5 million prescription items to about 16.5 million prescription items per year) was matched by a rise in prescriptions for anti-depressants of about 200% (from about 7.5 million prescription items to around 22 million prescription items per year).

The small increase in the number of prescriptions dispensed for dexamphetamine and methylphenidate might seem surprising, in view of the contemporary debates about the rise of the use of these drugs for the treatment of Attention Deficit Hyperactivity Disorder. But the overall rise in prescription items dispensed-of about 130%, from just over 111,000 items in 1980 to just over 260 thousand in 2000-disguises the increase in the quantity of the drugs being prescribed which has risen almost five-fold, from 6,280,790 standard units in 1980 to 29,358,340 in 2000: almost two thirds of this growth is accounted for by Ritalin which was first introduced to the UK in 1991. The net ingredient cost of these ADHD-related drugs rose from £72,970 in 1980 to a staggering £29,358,340 in the year 2000.

The total cost of all these classes of psychiatric drugs rose tenfold in the period from 1980 to 2000, from around £50m per annum to around £530m in 2000. However this is broadly consistent with the rising cost of the drug bill generally: expenditure on psychiatric drugs remains at about 8% of National Health Service drug expenditure. This is a point that should be born in mind: the increasing worldwide dependence of health services on commercial pharmaceuticals is not restricted to psychiatric drugs and much of the growth in this sector is in line with that in drugs used for other conditions.

Data on overall trends in psychiatric drug prescribing in the United States in the period from 1955 to 1980—which would include drugs dispensed in hospitals, by community mental health centers, and to outpatients in drugstores—is difficult to obtain. It has been estimated that by the mid-1970s more than one-fifth of the non-institutionalized population received at least one prescription of psychotropic drugs annually; that in 1977, annual US expenditure on such drugs totalled \$850 million; and that in 1974 there were 70 million prescriptions for Valium (diazepam) and Librium (chlordiazepoxide) amounting to 3 billion tablets of Valium and 1 billion tablets of Librium (Brown, 1985: 150). Figures on prescriptions dispensed by drugstores or pharmacies show that the total numbers of prescriptions dispensed in this way actually peaked in the early 1970s, and by 1980 the numbers more or less returned to their 1964 levels. This pattern is largely explained by the rise and fall of the use of minor tranquillizers.

The USA

The first of the minor tranquillizers, meprobramate, marketed by Wallace under the name of Miltown, and by Wyeth as Equanil came onto the American market in 1955, amid a welter of favorable publicity about "happy pills" and "aspirin for the soul." Demand soon became greater than for any other drug marketed in the US and around 35 other "tranquillizers" were brought to market, each claiming to be better than the others. These drugs displaced the barbiturates and other sedatives from their place in the pharmacopoeia, although both doctors and lay people often confused them with chlorpromazine and reserpine, and referred to them all as "tranquillizers." By the end of the 1950s, a number of critical reviews were published, arguing that the available studies failed to show that meprobramate was more effective than placebo in treating anxiety; some claimed that, in fact, it was not less toxic than Phenobarbital. In any event, this first generation of minor tranquillizers were themselves soon to be displaced. Librium, developed and marketed by Roche, was the first of the benzodiazepines to come to market, and it soon became the most prescribed drug in the US. However it soon turned out that it had some undesirable side effects and could cause fits if suddenly discontinued. Valium, also marketed by Roche, displaced Librium from its top spot in 1969.

By the mid-1970s, the term Valium was being used generically to mean tranquillizer. But, in what was to become a familiar pattern, initial professional

enthusiasm, public eagerness, and glowing reports about efficacy gave way to critical reviews calling for caution and further study. And before long, there were reports of "overuse" and cries of alarm from some doctors and the press. The manufacturers, supported by many respectable physicians, met these alarms by arguing that the drugs could, in fact, be used appropriately—the problem could be solved by issuing clear guidelines for prescribing. Nonetheless, in response to publicly expressed concerns, a series of congressional hearings from 1959 to 1965, and again in the 1970s, considered various aspects of these tranquillizers and other drugs, examining costs, prescribing practices, promotional literature and advertisements.

In 1962, an Act strengthened the powers of the Food and Drug Administration (FDA) in evaluating the safety of drugs and regulating the ways in which they were advertised and promoted. Following this legislation, on several occasions, the FDA required the manufacturers of minor tranquillizers to modify their advertising, labeling, and product information. They were instructed to remove the implications that the drugs should be used for managing the worries and stresses of everyday life, and to stress the potential dangers of dependence and addiction and the difficulties consequent upon discontinuation. In 1975, the FDA moved the benzodiazepines and meprobramate to its "Schedule IV" which controlled "refills" or repeat prescriptions, and also imposed reporting requirements on pharmacists: predictably, prescribing declined.

What of other psychiatric drugs over this period? Data on prescriptions filled at pharmacies, even though they do not reflect hospital prescribing, show that while prescriptions for anti-depressants rise until 1974 and then stay roughly constant, those for antipsychotics peak at the same date and then fall slowly. The explanation for this pattern for anti-psychotics may lie in the gradual acceptance that these drugs, especially when prescribed at high doses over long periods, produced adverse effects—notably the irreversible condition of involuntary bodily movements that became known as tardive dyskinesia. In the early years of the use of neuroleptic drugs, psychiatrists tended to assume that so-called extra-pyramidal effects in patients being administered neuroleptic medication—Parkinson-like symptoms—were signs that the drugs were working, and hence markers of a therapeutic reaction. Most believed that these effects disappeared when the medication was discontinued, although there were reports from the mid-1950s that Parkinson-like symptoms and

other effects might persist-in the so-called "neurotoxic reactions." The syndrome of late onset severe movement abnormalities most noticeable in the mouth, lips and tongue which is now known as tardive dyskinesia was actually first described within a few years of the introduction of the neuroleptics. The definitive English language article on neurological complications of the antipsychotics was published in 1961, but there was continuing skepticism from many psychiatrists about the reality of this problem and its relation to drugs.

During the 1960s many leading psychiatrists involved in the developments of psychopharmacology suggested that the dyskinesias could be demonstrated in untreated patients and were actually a sign of the illness or that, in any event, problems without the drugs were worse than those caused by the drugs. But by the late 1960s, the view that long-term treatment might cause a problem was being given authoritative support. The FDA and the American College of Neuropsychopharmacology set up a Task Force which reported in 1973: it acknowledged that tardive dyskinesia could be presumed to result from treatment with anti-psychotic drugs. While the condition was "an undesirable but occasionally unavoidable price to be paid for the benefits of prolonged neuroleptic therapy," if possible "neuroleptics should be discontinued at the first sign of tardive dyskinesia. While the unnecessary use of high doses in chronic cases should be minimized" the medications could still "be used with confidence-the overwhelming clinical and objective evidence indicates that a majority of schizophrenic patients" should continue to receive medication.

Despite this cautious, vague and generally optimistic tone, the formal professional recognition of the condition and its causation opened the door for legal action. According to David Healy, the first case was in 1974, when SmithKline & French settled a claim for Thorazine induced tardive dyskinesia, and it seems that this led to the willingness of the manufacturer to acknowledge the risk of tardive dyskinesia in package inserts. Other lawsuits followed, focusing on informed consent, medical negligence, misdiagnosis, violation of civil rights and product liability. The American Psychiatric Association set up a task force chaired by Ross Baldessarini which reported in 1980: it acknowledged in its official summary that in routine neuroleptic drug use over six months to two years, at least 10-20 percent of patients would get more than minimum tardive dyskinesia.

By the 1980s, psychiatrists and the pharmaceutical companies were increasingly involved in litigation. According to Peter Breggin, on October 7, 1983, the official APA newspaper *Psychiatric News* carried the headline "TARDIVE DYSKINESIA COURT CASES UNDERSCORE IMPORTANCE OF APA REPORT" and reported that two precedent-setting cases had been settled for \$76,000 and \$1 million. A headline in the January 1984 issue of *Clinical Psychiatry News* warned its readers to "EXPECT A FLOOD OF TARDIVE DYSKINESIA MALPRACTICE SUITS." In 1985 the American Psychiatric Association wrote to each of its members to repeat its warning that "at least 10-20% of patients in mental hospitals" and at least 40 percent of longer term patients, would get more than minimal signs of tardive dyskinesia, confirmed that children were also at risk, and stated that they were "concerned about the apparent increase of litigation over tardive dyskinesia." By the end of the decade, tardive dyskinesia lawsuits were on the increase, and, according to *The Psychiatric Times*, out-of-court settlements were averaging \$300,000 and jury awards were averaging \$1 million. The first "golden age" of psychopharmaceuticals which had begun with Thorazine (Largactil in Europe) and which saw the development of a host of other antipsychotics: thioridazine (Melleril), haloperidol (Haldol), trifluoperazine (Stelazine) came to an end.

But despite the law suits, anti-psychotic drugs had become central to the rationale of deinstitutionalization in the United States by the mid-sixties and to the management of the decarcerated or never incarcerated-population. The gradual acceptance of the reality of tardive dyskinesia, of its prevalence, and of its causation by drug treatment could not reverse the policy or the use of the drugs. A dual strategy took shape. On the one hand, the pharmaceutical industry met with FDA to discuss how to label the propensity of their compounds to cause tardive dyskinesia. On the other hand, the search began for alternative drugs that would not produce such damaging side effects. This track would eventually lead to the marketing of the so-called "atypical neuroleptics." But it also underpinned other attempts to engineer so-called "smart drugs" which could be said to directly target the neurochemical bases of the illness, or at least the symptoms, with the minimum of collateral damage.

The first fruit of this line of thinking would be Prozac, soon followed by closely related selective serotonin reuptake inhibitors (SSRI). These were

apparently "smart" targeted drugs that seemed to have minimal adverse effects, were safe in overdose, seemed not to be "addictive" and, so it seemed, did not cause tardive dyskinesia. But it would not be long after the introduction of Prozac and its sisters that these assumptions would be challenged, and the shadow of the law would once more fall over psychopharmacology.

Despite the problems of adverse effects that affected both the minor tranquilizers and the antipsychotics, the dependence of psychiatry on psychopharmacology was entrenched over the 1980s. Indeed, other legal decisions reinforced the overall push towards psychopharmacology as the treatment of choice for most psychiatric conditions. The famous Osheroff case brought in 1982 involved a claim of malpractice against Chestnut Lodge-whose psychodynamic approach was made famous by Hannah Green in *I Never Promised You a Rose Garden*-on the grounds that Osheroff was denied available psychiatric medication that had proven efficacy. While the case was in fact settled out of court in 1987, and thus did not set a legal precedent, it generated much discussion. It was used to argue that the most valid and convincing evidence of efficacy must be derived from randomized control trials, and that psychotherapies had not passed any equivalent of the scrutiny maintained by the FDA over drugs. From this point on, psychiatrists and psychiatric institutions had to think of the legal consequences whenever they chose *not* to prescribe medication for their patients.

Other changes in the US health care system in the 1980s also contributed to the rise of psychopharmacology. The first of these relates to research and development. The pharmaceutical industry's portion of total U.S. health R&D funding grew from 13 percent in 1980 to 52 percent in 1995. During this same period, despite substantial increases in financial support for health research through the National Institutes of Health, the federal government's share of total health R&D funding dropped from 57% to 37%. Non-profit organizations contributed 4 percent to health R&D funding and state and local governments added 7 percent. When pharmaceutical companies provide a majority of funding for research and development in the US health sector, they clearly have considerable power, not just to determine new product development, but also to shape the very styles of thought which organize responses to mental health and mental illness.

Secondly, the funding of health care provision has shifted with the introduction of managed care

and the reduction of in-patient treatment. Since 1980, pressure on funding in the health care system, among other things, has led to a decline in overall rates of hospitalization for all conditions by over 30%. Although only 12% of the US population is covered by Medicaid, Medicaid patients account for 50% of all hospitalizations for schizophrenia and 28% of all hospitalizations for depression, and there is great pressure to reduce Medicaid budgets. And in the era of "managed care," a Health Management Organization acts as an intermediary between the users of health care services, the funders and the providers. These HMOs are commercial companies whose profits depend upon their success in implementing a range of what are euphemistically termed "cost-containment techniques"-procedural rules governing the choices of doctors and others, for example by placing strict limits on periods of hospitalization, refusing to authorize requests by medical staff for extended stay, controlling the drug budget by monitoring prescribing practices in the interests of cost saving and insisting on generic alternatives where available, requiring physicians to adopt a step-care technique in which they begin with the lowest cost treatment and only progress to higher-cost alternatives if these are deemed "ineffective," delimiting the amount of service, and the type of service, which may be provided for particular conditions. In this context, drug treatment outside hospital becomes the treatment of choice, although short-term, focused, behavioral or cognitive therapy may also be funded, designed to ensure that the patient has the insight to recognize that he or she is suffering from an illness, and hence to increase the likelihood of compliance with medication.

The current levels of psychiatric drug prescribing in the United States should come as no surprise. In the year from July 1999 to June 2000, sales of psychiatric drugs, at ex-manufacturer prices, totaled 15,203,486,000 US dollars (1990: 2,502,703,000). 58.4% was for anti-depressants (1990: 38.2%). 22.8% was for anti-psychotics (1990: 10.1%); the increase in value here presumably arises from the marketing of the so-called atypical anti-psychotics since it does not reflect an increase in numbers of these drugs prescribed. 9.3% was for tranquilizers (1990: 39.5%), 5.5% was for hypnotics and sedatives (1990: 9.2%) and 3.9% was for psycho-stimulants (1990: 3.0%).

Of course, such figures are affected by variations in price, for example the lapse of patents on certain drugs and their availability in generic forms.

A more accurate guide to trends is provided by data expressed in terms of the number of standard doses sold. Over the decade from 1990-2000 there were two principal contributors to the overall growth in prescribing. Tranquillizers show a 32.5% growth over the decade, peaking and falling away after 1998. Anti-depressants show a steady growth over the period, amounting to 205% overall. Indeed the growth in use of anti-depressants may have contributed to the fall off in the use of tranquillizers in the mid-1990s, because it appears that Prozac and the other SSRI drugs were now being prescribed for the treatment of conditions where minor tranquillizers would previously have been given. At the end of the decade, anti-depressants were by far the most extensively prescribed psychiatric drug, amounting to around 45% of all drug prescribing, with tranquillizers constituting around 27%. However, while the commonly accepted view is that the growth in the diagnosis of depression is linked, more or less directly, to the availability of the new antidepressants, the figures do not entirely bear that out.

The SSRI family of anti-depressants do show a spectacular rise of over 1300% over this period with final prescribing levels more or less equally split between fluoxetine (Prozac), Sertraline (Zoloft) and Paroxetine (Paxil) though with the newer SNRIs coming up fast. But the traditional anti-depressants also show a steady rise, though from a higher base, and by 2001 they still amount to 48% of the total antidepressant market. It seems that, however it is treated, what is involved here is the increase in the diagnosis of something called depression, as that which is potentially treatable by anti-depressants. These anti-depressants have spread beyond their initial niche and have extended their claims of efficacy to a whole class of relatively new conditions the anxiety disorders to which I will return.

It is widely accepted that there is something of an epidemic of Attention Deficit Hyperactivity Disorder in the United States. The aggregated data for prescriptions of psycho-stimulants from 1990 to 2000 thus initially seem surprisingly. This illustrates some of the cautions that need to be used in interpreting aggregated data, which combines the trends in prescribing in the different drugs within each class. The class of psycho-stimulants as a whole has shown very little overall growth over this decade, remaining at just under 10% of all prescribed psychiatric drugs. But it covers a range of different preparations, not just amphetamines, dexamphetamine, methamphetamine, and methylphenidate - the CNS stimulants used in the treat-

ment of ADHD. Two other groups of drugs classed as psycho-stimulants were prescribed heavily in the United States up until the mid-1990s. The first of these were the amphetamine based drugs that were marketed heavily as anti-obesity drugs up to the mid 1990s, including dexfenfluramine (Adifax; Diomeride; Dipondal; Glypolix; Isomeride; Isomerin; Obesine; Redux; Siran) and fenfluramine. These were removed from the US market around 1997 after evidence of severe adverse effects was finally accepted. The second group of drugs were stimulants based on caffeine and epinephrine, such as Viviran, which also disappear from the IMS data in the mid-1990s, as their status changed and they became available over-the-counter.

If we consider just the drugs used to treat ADHD, data provided to the US Drug Enforcement Agency by IMS Health show that after increases in the early 1990s, prescriptions for methylphenidate leveled off at about 11 million per year, and those for amphetamines, primarily Adderall (which is an amphetamine-dextroamphetamine mixed salt) increased dramatically since 1996, from about 1.3 million per year to about 6 million per year. Collectively this indicates an increase of prescriptions for ADHD by a factor of 5 in the period 1991 to 1998. IMS data show that the total number of standard units prescribed rose by almost 800 percent from 1990 to 2000, from around 225 million to around 1,800 million, the early growth being in Methylphenidate-Ritalin-whose dominance has recently been challenged by dexamphetamine-Adderall.

The epidemic of prescribing for ADHD in the United States seems a pretty clear example of a "culture bound syndrome." The medications used here are potential drugs of abuse subject to the provisions of Article 16 of the 1971 Convention on Psychotropic Substances, and their manufacture and consumption is monitored by the United Nations Narcotics Control Board, which reports annually. The U.S. Drug Enforcement Administration used UN Narcotics Control Board figures in its congressional testimony in May 2000, to claim that domestic sales of methylphenidate, calculated in kilograms per year, had risen by 500% from 1991 to 1999, and those for amphetamine had risen even more sharply, by 2000%, although from a lower base. Data in the Narcotics Control Board reports for 1995, 1996 and 1998 show the trends for the consumption of methylphenidate and amphetamines in various countries from 1993 to 1998. Overall, these data show that by the year 2000, around seven million standard doses of psychiatric medication were

being prescribed in the United States per 100,000 population-or an average of around 70 doses per person per year.

Accounting for Psychopharmacology

The patterns of growth in the commercial value of the market for psychopharmaceuticals are clear enough, at least in the United States and the UK, and in Europe more generally. Broad similarities exist between overall rates of psychiatric drug prescribing proportional to population size in the US, Europe and Japan, and the same broad similarities, although at a much lower level, exist between the three "less developed" regions of South Africa, South America and Pakistan.

The most interesting comparator for the UK and the US is Japan. While the overall rate of psychiatric drug prescribing in Japan is broadly similar to that in Europe and the United States, at around 6.6 million standard dosage units per annum per 100,000 population, a far greater proportion of those prescriptions are for tranquillizers and anti-psychotics and less than 15% are for anti-depressants. Japan seems not to have had the wave of concerns over the benzodiazepines and the traditional neuroleptics that shook psychopharmacology in the West nor does it seem to have experienced the "epidemic" of depression and anti-depressants. Indeed fluoxetine hydrochloride was never marketed in Japan, and the first SSRI type drugs (fluvoxamine and paroxetine) did not come on the market until 1999 and 2000. And ADHD is only just being "discovered" in Japan.

How, then, can we account for the specificity of the UK and US? The best researched case is that of depression. Of course, the simplest explanation for the remarkable rise in diagnosis of depression and the prescription of anti-depressants over the last decade is, first, that that depression is more common than has previously been realized, and second that we now have powerful and effective new drug therapies to treat it. The first seems to be the view, for example, of the World Health Organization, whose 2001 report claimed depression affects over 340 million people worldwide, argued that it is exacerbated by social factors such as an aging population, poverty, unemployment and similar stressors, and predicted "By the year 2020, if current trends for demographic and epidemiological transition continue, the burden of depression will increase to 5.7% of the total burden of disease, becoming the second leading cause of DALYs [disability adjusted life years] lost. Worldwide it will be second only to ischemic heart disease for DALYs

lost for both sexes. In the developed regions, depression will then be the highest ranking cause of burden of disease."

The second is the view, not just of the drug companies and some psychiatrists, but also of some key campaigning groups, that mental illness is an organic disease. By 2001 the National Alliance for the Mentally III proclaimed mental illness a treatable brain disorder treated with medication just like diabetes is treated with insulin. In both the UK and the US, campaigns to "recognize depression" operate in these terms: arguing that depression is an illness, often inherited in the form of increased susceptibility and triggered by life events, that it is often untreated, and that drugs form the first line of treatment-for example in the recent Defeat Depression in the UK. This view of the biochemical basis of, and treatability of, depression has also been popularized in a number of autobiographical accounts by well-known public figures: for example, *Darkness Visible* by William Styron, or *The Noonday Demon* by Andrew Solomon.

Most of those who have explored this rise are not satisfied with such a "realist" account. There is certainly convincing epidemiological evidence that such factors as poor housing, poverty, unemployment or precarious and stressful working conditions are associated with increased levels of psychiatric morbidity. But these factors do not seem sufficient to account for such a rapid increase in diagnosis and prescription, even if it was accepted that contemporary social conditions were more pathogenic than those that preceded them. Older sociological explanations that linked the rise of mental disorders to general features of social organization have fallen out of fashion for example, the suggestion that urban life generates neurasthenia or that capitalism isolates individuals and hence places strains on them that lead to mental breakdown-with the possible exception of feminist accounts in terms of patriarchy.

Alain Ehrenberg has recently suggested that the very shape of depression is the reciprocal of the new conceptions of individuality that have emerged in modern societies. At the start of the twentieth century, he argues, the norm of individuality was founded on guilt, and hence the exemplary experience of pathology what that of neurosis. But in societies that celebrate individual responsibility and personal initiative, the reciprocal of that norm of active self-fulfillment is depression, now largely defined as a pathology involving the lack of energy, an inability to perform the tasks required for work or relations with others. While such a global

cultural account is unconvincing, it is certainly the case that the shape and incidence of the pathology of depression in Western developed nations can only be understood in relation to contemporary conceptions of the self involving the obligation of freedom: responsibility, choice and active self-fulfillment. The continual incitements to action, to choice, to self-realization and self improvement act as a norm in relation to which individuals govern themselves and are governed by others, and against which differences are judged as pathologies.

But other factors also need to be addressed. First, no doubt, these developments are related to the increasing salience of health to the aspirations and ethics of the wealthy West, the readiness of those who live in such cultures to define their problems and their solutions in terms of health and illness, and the tendency for contemporary understandings of health and illness to be posed largely in terms of treatable bodily malfunctions. Second, they are undoubtedly linked to a more profound transformation in personhood. The sense of ourselves as "psychological" individuals that developed across the twentieth century-beings inhabited by a deep internal space shaped by biography and experience, the source of our individuality and the locus of our discontents-is being supplemented or displaced by what I have termed "somatic individuality." By somatic individuality, I mean the tendency to define key aspects of one's individuality in bodily terms, that is to say to think of oneself as "embodied," and to understand that body in the language of contemporary biomedicine. To be a "somatic" individual, in this sense, is to code one's hopes and fears in terms of this biomedical body, and to try to reform, cure or improve oneself by acting on that body. At one end of the spectrum this involved reshaping the visible body, through diet, exercise, and tattooing. At the other end, it involves understanding troubles and desires in terms of the interior "organic" functioning of the body, and seeking to reshape that - usually by pharmacological interventions. While discontents might previously have been mapped onto a psychological space-the space of neurosis, repression, psychological trauma-they are now mapped upon the body itself, or one particular organ of the body-the brain.

This is not the place to explore the processes that have led to such discontents and their treatments being understood in this way-premised on the belief that the brain itself is the crucial locus of the disorder and the target of the treatment. However, it is possible to consider one limited aspect of this,

which concerns the reshaping of particular kinds of experiences as mental disorders amenable to pharmacological treatment. Most notable, here, is the way in which many pathologies of the active, responsible, choosing self have come to be seen as depression, and depression itself has come to be linked with anxiety disorders-in particular generalized anxiety disorder, social anxiety disorder, panic disorder, obsessive compulsive disorder and post traumatic stress disorder. This involves a co-production of the disease, the diagnosis and the treatment. This can be seen in the strategies of psychiatrists, of health care professionals, of some support and anti-stigma groups, but most significantly of the pharmaceutical companies themselves.

The earliest (and most quoted) example of this co-production of disorder and treatment concerns depression. Frank Ayd had undertaken one of the key clinical trials for Merck, which filed the first patent for the use of amitriptyline as an anti-depressant. Ayd's book of 1961, *Recognizing the Depressed Patient*, argued that much depression was unrecognized, but that it did not require a psychiatrist for its diagnosis-it "could be diagnosed on general medical wards and in primary care offices." Merck bought up 50,000 copies of Frank Ayd's book and distributed it worldwide. As Healy argues, Merck not only sold amitriptyline, it sold a new idea of what depression was and how it could be diagnosed and treated. From this point on it appeared that there was an untapped market for antidepressant drugs outside hospitals. There was also an audience for the idea that the certain drugs specifically targeted the neurochemical basis of depression, and pharmaceutical companies invested funds in research to develop antidepressants. Rating scales to identify depression were developed (notably the Hamilton depression scale); these generated new norms of depression which were not only used to test the efficacy of drugs, but also changed the shape of the disorder itself. Across the 1960s depression became linked to levels of secretion and reuptake of brain amines in the synapses-gradually coming to focus on serotonin. The serotonin hypothesis of depression was formulated, and despite its obvious scientific inadequacies, it became the basis of drug development leading to the SSRIs and the basis of a new way of thinking about variations in mood in terms of levels of brain chemicals that penetrated deeply into the imagination of medical practitioners and into popular accounts of depression.

The central presupposition, perhaps more significant than any individual drug, was that of specific-

ity. This presupposition was actually three sided. First, it was premised on the neuroscientific belief that these drugs could, and ideally should have a specificity of target. Second, it was premised on the clinical belief that doctors or patients could specifically diagnose each array of changes in mood, will, desire, affect as a discrete condition. Third, it was based on the neuroscientific belief that specific configurations in neurotransmitter systems underlay specific moods, desires, and affect. The three presuppositions were then mapped onto one another. Thus the iconic status of Prozac arose less from its greater efficacy in treating clinical depression, than from the belief that it was first "smart drug," in which a molecule was designed with a shape that would enable it specifically to lock into identified receptor sites in the serotonin system-hence affecting only the specific symptoms being targeted and having a low "side effect profile." And, on the other hand, its status was confirmed by clinical reports and popular accounts such as those given by Peter Kramer to Elizabeth Wurtzel of the specific psychological transformations wrought by the drug. These presuppositions have fueled an industry of commentary utopian or dystopian -on cosmetic psychopharmacology and the possibilities of reshaping our human nature at will, most recently from Gregory Stock on the one side and Frances Fukuyama on the other. However, as neurochemical and pharmacological research proceeded, the simple belief that there was one kind of receptor for each neurotransmitter was shown to be wrong in the case of serotonin there were at least seven "families" of 5HT receptors and most had several subtypes. This might have proved fatal for this explanatory regime, but it did not. It was now argued that each of these subtypes of receptors had a specific function, that anomalies in each type were related to specific psychiatric symptoms, and that they could be ameliorated by drugs designed specifically to affect them.

The premises of specificity were central to the vigorous campaigns that the pharmaceutical companies mounted to market their products to physicians. An advertisement for Lustral (sertraline) published in the *British Journal of Psychiatry* in 1991 stressed its selectivity, effectiveness, low side effects, low dependency, compliance and simplicity. That assemblage of virtues is condensed into a simple brand name-Lustral-manufactured by Pfizer (marketed as Zoloft in the US) with its smiley image and rising sun logo.

Another example, Prozac, promises to the doctor and his or her patient to deliver the "therapeutic triad" of convenience, confidence and compliance. By 1995, advertisements for Prozac contained increased space devoted to adverse events. This may have had something to do with the fact that in autumn 1994, the first lawsuit against Prozac reached the courtroom in Louisville, Kentucky, concerning Joseph Wesbecker who some five years earlier, shortly after being prescribed Prozac, had shot 28 people at the printing plant where he worked, killing 8 before shooting himself. This case brought long standing concerns about adverse effects of these drugs into public view-concerns about increases in agitation (akathisia) and suicidal ideation in a small but significant number of those administered Prozac-which had led the German licensing authorities to insist upon product warning in 1984 before they would issue a license. As the first generation of the drugs goes out of patent, the manufacturers are also fighting against a shoal of analogous cases.

In June 2001, a court in Cheyenne, Wyoming, ordered GlaxoSmithKline to pay \$6.4 million to the family of Donald Schell who shot his wife, daughter and granddaughter and then killed himself-two days after his general practitioner prescribed Paxil (paroxetine, known as Seroxat in Europe) for depression. The jury decided that the drug was 80% responsible for the deaths. And two weeks earlier, in May 2001, an Australian judge ruled that prescribing of sertraline-Zoloft-which is Australia's most widely used anti-depressant-to David Hawkins had caused him to murder his wife and attempt to kill himself: "I am satisfied that but for the Zoloft he had taken he would not have strangled his wife" (Justice Barry O'Keefe). If that were not enough, criticisms are now mounting about the difficulties of withdrawing from this medication-not dependency as is often suggested, but the severe and unpleasant physical effects-pains, sweating, nausea and much more-which occur when patients who have taken these drugs for a while cease to take them-no doubt caused by the fact that the molecules act very widely in the body, and the artificial raising of the levels by the drugs leads to a down regulation of the bodies own production of, or sensitivity to the molecules in question.

Recall that Prozac was initially marketed as a specific for mild to moderate depression, but was soon surrounded by claims that it was much more versatile, acting, for example, on eating disorders, obsessive compulsive disorder and even low self-

esteem. For some, this questioned the very distinctions and classifications on which modern American psychiatric medicine rests. For a belief in the reciprocal specificity of disorders and drug action implies that the drugs, and the span and limits of their efficacy, should determine the criteria for inclusion in, and the boundaries around, mental disorders. But, more immediately, this diversity of classifications provides a key marketing opportunity. Companies seek to diversify their products and niche market them, either by making minor modifications to produce new molecules, or by licensing their existing drugs as specifics for particular diagnostic categories of *Diagnostic and Statistical Manual IV*. The best example concerns the anxiety disorders-Social Anxiety Disorder, Panic Disorder and Generalized Anxiety Disorder. Let us focus on GAD, and its relation with one particular brand- Paxil, owned by GlaxoSmithKline.

As recently as 1987, the section on prevalence of this disorder (coded 300.02) in the third, revised edition of the *Diagnostic and Statistical Manual* (DSM) of the American Psychiatric Association said "When other disorders that could account for the anxiety symptoms are ruled out [they previously stipulated that the disorder should not be diagnosed if the worry and anxiety occurs during a mood disorder or a psychotic disorder, for example], the disorder is not commonly diagnosed in clinical samples" (252). By the publication of *DSM IV*, in 1994, the same section read "In a community sample, the lifelong prevalence rate for Generalized Anxiety Disorder was approximately 3%, and the lifetime prevalence rate was 5%. In anxiety disorder clinics, approximately 12% of the individuals present with Generalized Anxiety Disorder." In this move, GAD was reframed: the diagnosis could now co-exist with mood disorders, and could be separated out from the general class of mood disorders. The clinical trials of Paxil in the treatment of GAD thus enabled it to be advertised as a specific treatment for this condition, and hence the disorder could be freed, in its public representations at least, from depression. And once it could stand as a diagnosis without subsumption into the class of depression, its prevalence could be recalculated. By April 2001, when GlaxoSmithKline announced that the US Food and Drug Administration (FDA) had approved Paxil for the treatment of GAD-the first SSRI approved for this disorder in the US-it was widely being claimed that GAD affected "more than 10 million Americans, 60 percent of whom are women."

In fact, Paxil had been widely used "off label" for the treatment of GAD before being specifically licensed for the condition. Licensing is significant, however, because it allows marketing for the licensed indication. As soon as the license was issued in the spring of 2001, GlaxoSmithKline engaged in a marketing campaign in the US. What was characteristic about this campaign is that it marketed, not so much the drug, Paxil, as the disease, GAD. While the US is one of the few countries that allow "direct to consumer" advertising of prescription drugs-which has grown into a \$2.5 billion a year industry since drug advertising legislation was relaxed in 1997-it is not the only country where "disease mongering" has become a key marketing tactic. As Ray Moynihan and others have recently pointed out, this process involves alliances are formed between drug companies anxious to market a product for a particular condition, biosocial groups organized by and for those who suffer from a condition thought to be of that type, and doctors eager to diagnose under-diagnosed problems.

Disease awareness campaigns, directly or indirectly funded by the pharmaceutical company that has the patent for the treatment, point to the misery caused by the apparent symptoms of this undiagnosed or untreated condition, and they interpret available data so as to maximize beliefs about prevalence. They aim to draw the attention of lay persons and medical practitioners to the existence of the disease and the availability of treatment, shaping their fears and anxieties into a clinical form. These often involve the use of public relations firms to place stories in the media, providing victims who will tell their stories and supplying experts who will explain them in terms of the new disorder. Examples include baldness and Propecia, erectile dysfunction and Viagra, and irritable bowel syndrome and Lotronex. Among other examples are Pfizer's promotion of the new disease entity of "female sexual dysfunction" and the promotion by Roche of its anti-depressant Auroxix (moclobemide) for the treatment of social phobia in Australia in 1997. This involved the use of the public relations company to place stories in the press, an alliance with a patients group called the Obsessive Compulsive and Anxiety Disorders Federation of Victoria, funding a large conference on social phobia, and promoting maximal estimates of prevalence. These are not covert tactics-as a quick glance at the Practical Guides published on the Internet by the magazine *Pharmaceutical Marketing* shows.

These rather general and fuzzy new disorders such as OCD and PD are connected up to a whole style of molecular argumentation designed to emphasize the specificity of the neurochemical basis of the diagnosis and the mode of action of the drug. This new style of thought is thus simultaneously pharmacological and commercial. Drugs are developed, promoted, tested, licensed and marketed for the treatment of particular *DSM IV* diagnostic classifications. Disease, drug and treatment thus each support one another through an account at the level of molecular neuroscience.

As an SSRI drug for the treatment of depression, Paxil had arrived relatively late on the scene. But nonetheless the rate of increase in prescribing in the US kept pace with the brand leaders, and by 2001, as it succeeded in linking itself to the treatment of the anxiety disorders, it achieved a market share about equal to Pfizer's Zoloft and Lilly's Prozac.

Other drug manufacturers rushed to trial and re-license their own anti-depressants so that they could promote them as treatments for GAD and the other related anxiety disorders-Wyeth with Venlafaxine XR, Pfizer with Zoloft-or to patent and license new molecules specifically for this diagnosis. Pfizer bought the rights to Pagoclone from Indevus Pharmaceuticals, but returned them in June 2002 when the results of its clinical trials failed to show levels of efficacy significantly above placebo-Indevus stocks dropped by 65% on the day of the announcement and Pfizer concentrated its efforts on its own drug Pregabalin. Shareholder value and clinical value appear inextricably entangled.

These links and relays between classification of disorders, marketing, testing, licensing and promoting psychopharmaceuticals have recently received much criticism. Many leading figures in American-and worldwide-psychiatry act as consultants for the pharmaceutical companies, rely upon them for funds for their research, are involved in clinical trials, testing and evaluating of their products, are on the committees responsible for revising and updating diagnostic criteria, advise the licensing authorities on the acceptability and risk of drugs, and indeed have financial interests and shares in the companies themselves.

Conclusion

By the 1990s a fundamental shift had occurred in psychiatric thought and practice. No matter that there was little firm evidence to link variations in neurotransmitter functioning to symptoms of de

pression or any other mental disorder in the living brains of unmedicated patients-although many researchers are seeking such evidence and occasional papers announce that it has been found. And no matter that most of the new smart drugs are no more effective than their dirty predecessors for moderate or severe depression-they are favored because they are claimed to be safer, and to have fewer "unwanted effects." A way of thinking has taken shape, and a growing proportion of psychiatrists find it difficult to think otherwise. In this way of thinking, all explanations of mental pathology must "pass through" the brain and its neurochemistry - neurones, synapses, membranes, receptors, ion channels, neurotransmitters, enzymes, etc.

Diagnosis is now thought to be most accurate when it can link symptoms to anomalies in one or more of these elements. And the fabrication and action of psychiatric drugs is conceived in these terms. Not that biographical effects are ruled out, but biography-family stress, sexual abuse-has effects through its impact on this brain. Environment plays its part, but unemployment, poverty and the like have their effects only through their impact upon this brain. And experiences play their part substance abuse or trauma for example-but once again, through their impact on this neurochemical brain. A few decades ago, such claims would have seemed extraordinarily bold-for many medicopsychiatric researchers and practitioners, they now seem "only common sense."

And, in the same movement, psychiatry has become big business. One of the criticisms of the private madhouses before the spread of public asylums was that they were generating what was termed "a trade in lunacy" in which profit was to be made by incarceration-leading to all manner of corruption. No one made enormous sums out of public psychiatry in the nineteenth century, or indeed up until the middle of the twentieth. One of the eugenic arguments in Nazi Germany was that the care of the psychiatric ill was an enormous drain on the public purse. Of course, as we know, in the second half of the twentieth century, psychotherapy and counseling became big business. But psychiatry itself-in the mental hospitals, the clinics, the GPs surgeries and the private psychiatric consulting room-also became a huge and profitable market for the pharmaceutical industry. Only the large pharmaceuticals companies can now afford the risk-capital involved in the developing, testing and licensing of a new psychiatric drug. And because contemporary psychiatry is so much the outcome of develop-

ments in psychopharmacology, this means that these commercial decisions are actually shaping the patterns of psychiatric thought at a very fundamental level. The factories of the pharmaceutical companies are the key laboratories for psychiatric innovation, and the psychiatric laboratory has, in a very real sense, become part of the psychopharmacological factory. Many of these large multinational conglomerates make a considerable proportion of their income from the marketing of psychiatric drugs, and their success, Or failure, in attracting market share is key to maintaining the shareholder value of the company.

The most widely prescribed of the new generation of psychiatric drugs treat conditions whose borders are fuzzy, whose coherence and very existence as illness or disorders are matters of dispute.

Paul Rabinow's assessment of the new life sciences is especially apt for psychiatry-the quest for truth is no longer sufficient to mobilize the production of psychiatric knowledge-health-or rather, the profit to be made from promising health-has become the prime motive force in generating what counts for our knowledge of mental ill health. From another perspective the developments in psychiatric drug use are merely one dimension of a new set of relations between ideas of health and illness, practices of treatment and prevention of bodily malfunctions, and commercially driven innovation, marketing and competition for profits and shareholder value. Where Foucault analyzed biopolitics, we now must analyze bioeconomics and bioethics, for human capital is now to be understood in a rather literal sense-in terms of the new linkages between the politics, economics and ethics of life itself.

Of course, to identify this new medico-industrial complex and to point to its power is not to criticize it. In a situation where only investment of capital on a large scale is capable of producing new therapeutic agents, such linkages of health and profitability might well be the inescapable condition for the creation of effective drugs. But the consequences of many of the developments we have charted here cannot be reduced to a debate about efficacy, as if illness, treatment and cure were independent of one another. We have seen that, in certain key respects, the most widely prescribed of the new generation

of psychiatric drugs treat conditions whose borders are fuzzy, whose coherence and very existence as illness or disorders are matters of dispute, and which are not so much intended to "cure"-to produce a specific transformation from a pathological to a normal state-as to modify the ways in which vicissitudes in the life of the recipient are experienced, lived and understood.

The best selling drugs these days are not those that treat acute illnesses, but those that are prescribed chronically. These include Lipitor for the lowering of blood lipid levels thought to predispose to heart attack and stroke; Premarin for the treatment of the effects of the menopause in particular its effects on sexuality; Atenolol and Norvasc for the long term management of high blood pressure; Prilosec for the treatment of Gastroesophageal Reflux Disease and heartburn. As for psychiatric drugs in the top twenty most prescribed drugs in the US in 2001, Xanax is 10th-it is a benzodiazepine used for the management of anxiety disorders-and two of the SSRIs we have discussed here-Zoloft (sertraline) and Paxil (paroxetine)-are in 14th and 15th place. These are the drugs most amenable to the extension and reshaping of the boundaries of disease and "treatability." They promise a power to reshape life pharmaceutically that extends way beyond what we previously understood as illness. Not just Premarin and its sisters, but previous generations of pharmaceuticals for contraception, have rewritten the norms of reproduction-its timetables, its kinship relations. Premarin and other forms of hormone replacement treatment have rewritten the norms of female ageing. Drugs such as Alazopram are rewriting the norms of social interaction. So the capitalisation of the power to treat intensifies the redefinition of that which is amenable to correction or modification. This is not simply blurring the borders between normality and pathology, or widening the net of pathology. We are seeing an enhancement in our capacities to adjust and readjust our somatic existence according to the exigencies of the life to which we aspire.

In the field of health, the active and responsible citizen must engage in a constant monitoring of health, a constant work of modulation, adjustment, improvement in response to the changing requirements of the practices of his or her mode of everyday life. These new self-technologies do not seek to return a pathological or problematic individual to a fixed norm of civilized conduct through a once off program of normalization. Rather, they oblige the individual to engage in constant risk manage-

ment, and to act continually on him or herself to minimize risks by reshaping diet, lifestyle and now, by means of pharmaceuticals, the body itself. The new neurochemical self is flexible and can be reconfigured in a way that blurs the boundaries between cure, normalization, and the enhancement of capacities. And these pharmaceuticals offer the promise of the calculated modification and augmentation of specific aspects of self-hood through acts of choice.

Psychiatric drugs today are conceived, designed, and disseminated in the search for bio-value. But they are entangled with certain conceptions of what humans are or should be—that is to say, specific norms, values, judgments internalized in very idea of these drugs. An ethics is engineered into the molecular make up of these drugs, and the drugs themselves embody and incite particular forms of life in which the "real me" is both "natural" and to be produced. The significance of the emergence of these new pharmacological treatments for mental ill health lies not only in their specific effects, but also in the way in which they reshape how both experts and lay people see, interpret, speak about and understand their world. Hence the growing market for nonprescription products that claim to enhance serotonin levels in the brain—in health food shops and of course on the Internet. A cascade of claims are made that everything from chocolate to exercise makes you feel good because it "enhances serotonin levels."

It seems that individuals themselves are beginning to recode their moods and their ills in terms of the functioning of their brain chemicals, and to act upon themselves in the light of this belief. Psychoanalysis brought into existence a whole new way of understanding ourselves—in terms of the unconscious, repression, neuroses, the Oedipus complex, and, of course, the theme of the centrality of sexuality to our psychic life. So it makes sense to ask whether general practitioners, psychiatrists and other mental health practitioners are beginning to see the problems their clients and patients experience in terms of this simplistic model of mental ill health as a disorder of neurotransmitters. To see in this way is to imagine the disorder as residing within the individual brain and its processes, and to see psychiatric drugs as a first line intervention, not merely for symptom relief but as specific treatments for these neurochemical anomalies. If we are experiencing a "neurochemical reshaping of personhood," the social and ethi-

cal implications for the twenty first century will be profound. For these drugs are becoming central to the ways in which our conduct is determined to be problematic and governed, by others, and by ourselves—to the continuous work of modulation of our capacities that is the life's work of the contemporary biological citizen.

SUGGESTED FURTHER READINGS

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Nikolas Rose is professor of sociology and convenor of the Department of Sociology at the London School of Economics. He is managing editor of Economy and Society, and director of the BIOS Centre for the Study of Bioscience, Biomedicine, Biotechnology and Society at the LSE. His books include Inventing Ourselves (1996), Governing the Soul (Second Edition, 1999), and Powers of Freedom (1999).

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