

Leading the pack: Reflections on Saskatchewan innovations in neuroscience

By Glen Baker, Erika Dyck and Darrell Mousseau

On February 3, 2012, the University of Saskatchewan Murray Library hosted an event to commemorate the legacy of Abram Hoffer and welcome his personal library into the university holdings. The collection represents over 1,500 books, including several texts that originated at the university during Hoffer's career in Saskatchewan. This donation, in combination with the hundreds of boxes of archival materials donated to the Saskatchewan Archives Board, provides researchers with an unprecedented opportunity to examine the history of psychiatry, neuroscience and the roots of orthomolecular or mega-vitamin therapies, and reinforces Saskatchewan's place as an innovator in this field. This article considers the contributions of three key players in that development and examines the conditions that gave rise to their pioneering research.



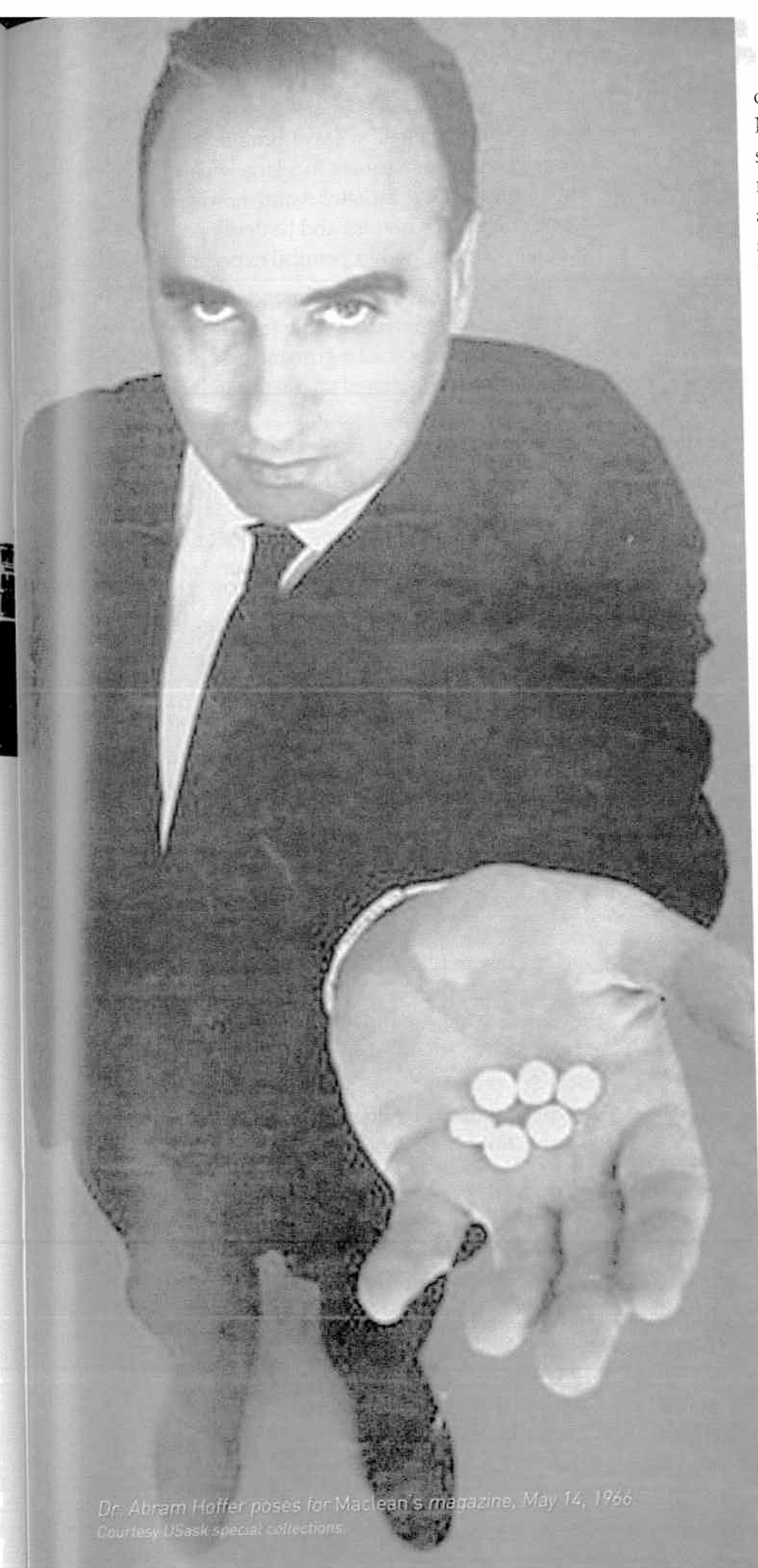
Saskatchewan Provincial Mental Hospital at Weyburn, taken circa 1920s.

In 1961, psychiatrist and superintendent of the Provincial Mental Hospital in Weyburn, Saskatchewan, Humphry Osmond, wrote to the provincial Premier, Tommy Douglas: "I'm not sure what the social implications will be of a measurable, visible, biochemical schizophrenia but it is, I think, (and one can always be a bit premature) very close round the corner."¹ Osmond, who four years earlier had coined the term "psychedelic" to describe the sensations associated with an LSD-induced psychosis, had spent a decade in Saskatchewan working with an interdisciplinary group of researchers and clinicians in pursuit of a new theory of schizophrenia that combined biochemical and psychological components. Although their theories lacked sophistication by today's standards, the climate of research and experimentation ignited in Saskatchewan during the 1950s helped to build a provincial reputation for innovation that endured for several decades.

Mental health resources in the first half of the twentieth century remained meagre and custodial in nature. Individuals suffering from mental diseases

had few treatment options, most of which included staying in overcrowded and underfunded institutions. The Canadian Mental Health Association identified Saskatchewan's two provincial mental hospitals, located in Weyburn and North Battleford, among the worst in Canada due to severe stress from overcrowding.² Within this context, the possibility of local research groups generating insights into the causes of mental illnesses and their respective treatments gained considerable attention.

The subsequent success of the Saskatchewan-based researchers drew from a combination of government support, stable funding, and a culture of research and experimentation that attracted personnel from international research centres to this province. The Tommy Douglas-led Co-operative Commonwealth Federation (CCF), elected in 1944, had promised sweeping reforms for Saskatchewan residents, particularly in the form of health services. While the political reforms later formed the blueprints for Canada's national Medicare program, there were also significant changes in the climate of clinical and scientific research during this period.



*Dr. Abram Hoffer poses for Maclean's magazine, May 14, 1966.
Courtesy USask special collections.*

The newly appointed Director of Psychiatric Services, D.G. (Griff) McKerracher, had a vision for psychiatric services in Saskatchewan that involved recruiting psychiatrists to the region and facilitating the development of an active research program, which he regarded as critical for improving health outcomes. One of his colleagues recalled McKerracher complaining that, "psychiatry suffered from being alienated from medicine. Medicine tended to be something you could see through a microscope and you can't see anything in psychiatry through a microscope. You can't lay hands on it, it is all ideas."³ This alienation from medicine manifested itself in separate facilities, separate training for psychiatrists, and, at that time, a focus almost solely on psychoanalysis as a fundamental feature of psychiatric practice. McKerracher felt that these features colluded to make psychiatry less attractive to medical residents, who rarely chose the field.

Psychiatrists, like the patients they served, experienced social and professional stigma as they languished in asylums with very little hope of producing cures for their patients. Prior to the introduction of drug therapies, known within the mental health community as psychopharmacological remedies that promised to restore health, or at least to control symptoms in patients, psychiatrists had very few tools at their disposal for addressing psychiatric disorders. Patients too suffered from the stigmatization associated with a diagnosis of mental illness. Institutional care offered support for families, but individuals who entered the asylum rarely, if ever, recovered. The asylum instead provided temporary relief for care-givers and a safe place for those who had already been estranged from their families.⁴



Photo taken by Michael Kesterton, courtesy Mike Kesterton.

Maclean's reporter Sidney Katz looks out from a ward in the mental hospital at Weyburn, 1953.

Within this context, Saskatchewan's reputation for psychiatric research reached international proportions, rivaling other groups in Montreal and Toronto in spite of the pioneering research in neurology and psychopharmacology, in particular, in these two cities. Although researchers in both Montreal and Toronto also experimented with LSD, their studies drew very different conclusions. Ewen Cameron of McGill University, working out of the Allen Memorial Clinic in Montreal, engaged in controversial studies that involved "depatterning" an individual using, among other things, repeat doses of LSD. He then theorized that a skilful therapist could replace unhealthy thought patterns with healthy ones.¹⁰ In Toronto, researchers at the Addictions Research Foundation tested the therapeutic qualities of LSD by designing trials that isolated the drug. That is, they did not interact with the subjects undergoing the experience as they attempted to measure a pure reaction, one that could not be confounded by environmental cues or distractions.¹¹

Contemporary publications in the leading Canadian medical journal, *Canadian Medical Association Journal*, revealed a growing rivalry among these different groups, which distinguished themselves with slightly different focal points while simultaneously widening the gulf between the American Psychiatric Association and the embryonic Canadian Psychiatric Association. This trend continued into the 1960s and 1970s. Canada, in general, benefitted from its closer ties to European research centres, including pharmaceutical developers, while the American Psychiatric Association continued to be dominated by analysts during this period. Within this

historical moment, Saskatchewan took advantage of the opportunity to adopt more of a leadership position in the growing field of neuroscience.

In 1961, research conditions in Saskatchewan began changing. Tommy Douglas left his post as Premier to lead the federal New Democratic Party, and, with his departure, Osmond left his post in Weyburn to become a research director at the Neurological Institute at Princeton. Hoffer, left to defend much of their research on his own, continued to work at the University of Saskatchewan, but increasingly came under pressure to justify continued research into LSD. By the mid 1960s, LSD had gained a reputation as a recreational drug and became especially popular for use among university students. In 1962, psychologist Timothy Leary famously and publicly lost his job at Harvard University for engaging in “unscientific” studies using LSD. He quickly catapulted in popularity by leading a so-called psychedelic revolution, using what would become an iconic phrase that exhorted people to “turn on, tune in and drop out.” The

Saskatchewan-based researchers got caught up in this cultural fervour and attempted to retain scientific credibility. By 1967, Hoffer left the university and started private practice. Meanwhile, the federal government debated and ultimately criminalized the use of LSD.

In spite of the legal challenges that constrained the clinical investigations, Saskatchewan remained a leader in neuroscience research and a new generation of researchers arrived to pick up the reins. In 1968, Alan Boulton arrived in Saskatoon from Birmingham, Britain, recruited by Dr. Gordon Marjerrison to take up a new position as Chief Research Biochemist in the Department of Psychiatry at the University of Saskatchewan. The British research unit he had been working in had lost its Medical Research Council grant, meaning that the scientists scattered. Boulton set his sights on Saskatchewan when he learned about its biochemical focus. Although during a 2002 interview he claimed that he knew nothing of the province before his arrival, he quickly learned that this “remarkable” group of researchers had

Patients and attendants in a crowded hospital ward in Weyburn, 1953.



Photo taken by Michael Restorion, courtesy Mike Restorion.

"brought schizophrenia out of the mysterious into the biochemical," while successfully convincing the local politicians of the merits of supporting untested research. The results, he suggested, were immediate, with psychiatric research centres being established in smaller centres in the province, including Moose Jaw, Yorkton, and Prince Albert in combination with the two major urban centres – Saskatoon and Regina – and the two provincial mental hospitals in North Battleford and Weyburn. Situating research centres right inside the clinical units, he suggested, provided a rare opportunity to readily combine efforts.¹²

Boulton had arrived in Saskatchewan already convinced of the merits of biochemical research into schizophrenia, but quickly recognized the opportunities to strengthen his conviction by forging a strong connection with his political allies, including the local politicians who made funding decisions. Within a few years of his arrival, Boulton secured regular funding for the Psychiatric Research Unit (later renamed the Neuropsychiatric Research Unit), and kept in close contact with the political authorities to ensure that this initiative ranked high on their agenda. Upon reflection, Boulton agreed that even with two generations of researchers devoted to improving the biochemical understanding of mental disorders, relatively few notable gains have been made in clinical terms. Nonetheless, he maintained that the kind of research conducted in the province set in motion a number of important developments, including stimulating further research into biogenic amine systems (these included such "amine-based" molecules as serotonin, noradrenaline and dopamine). Boulton's research focused on the trace amines 2-phenylethylamine, tyramine, octopamine and tryptamine (which are similar in structure to the amines listed above and also exert effects on brain function, but are at such low levels that they are considered "trace") and their involvement in the causes of a variety of psychiatric and neurologic disorders. His award-winning research in the field brought him international recognition and positioned him as a leading figure in biological psychiatry. He also took a leading role in the activities of national and international learned societies, serving at various times as President of the International Society for Neurochemistry, the American Society

for Neurochemistry and the Canadian College of Neuropsychopharmacology as well as Editor-in-Chief of the *Journal of Neurochemistry*. Boulton's administrative leadership helped to secure the research foundation that had been established by bringing new layers of administrative infrastructure to the research culture in Saskatchewan.

The recent passing of these early champions of neuroscience in Saskatchewan, Humphry Osmond (1917-2004), Abram Hoffer (1917-2009), and Alan Boulton (1936-2010) ultimately signals an end of that research era. Yet the legacy of their achievements has a more lasting endurance and draws attention to the more subtle ingredients that create a recipe for innovation. Far from any cosmopolitan urban centre, researchers in Saskatchewan were still able to make significant contributions to developments in neuroscience by virtue of strong leadership, political and economic support, and a dedicated culture of innovation and experimentation. As neuroscience becomes increasingly complex and expensive, it is instructive to reflect on this history of innovation in the field and consider whether size really does matter.

Endnotes on page 52.

Glen Baker, PhD, DSc, is Professor and Director of the Neurochemical Research Unit, Department of Psychiatry, University of Alberta. He is a former Chair of that Department and a past President of the Canadian College of Neuropsychopharmacology. Dr. Baker is a Fellow of the Canadian Academy of Health Sciences.

*Erika Dyck, PhD, is an Associate Professor and Tier 2 Canada Research Chair in History of Medicine at the University of Saskatchewan. She is the former co-director of the Medical History program at the University of Alberta and the author of *Psychedelic Psychiatry* (Johns Hopkins University Press, 2008).*

Durrell Mousseau obtained his Ph.D. at the University of Alberta and is now an Associate Professor with the Department of Psychiatry at the University of Saskatchewan. He is also the Saskatchewan Research Chair in Alzheimer's disease and related dementias, which is co-funded by the Alzheimer Society of Saskatchewan and the Saskatchewan Health Research Foundation.