Historical Geographies of Diabetes and Emotion

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1 How Is This Geographical?

Turning to David Livingstone (1993) and embracing his approach to "The Geographical Tradition," I employ his questions "What role, for example, did geography play in past society? Was it used for political, or religious or economic purposes by particular groups? Who benefited from the latest theory, and who lost out?" (p. 2). With these questions in mind, Firstly I bring to the fore an overview of different perspectives on diabetes from different places and pieces of history, then provide an examination of medical literature, historical writings and archival material to geographically situate the social, political and economic contexts of historical scientific thought on diabetes in relation to emotion, which will include historical examples of what role emotion plays and how it has been understood throughout a history of diabetes. Livingstone (1993) warns, "reconstructing intellectual history is never a once-and-for-all activity" (p. 3), but allows one to "work with a more realistic picture of geograhical knowledge as a cultural product and a political resource, without assuming that scientific knowledge is somehow immune to such forces" (p. 3). There are limitations to this historical approach beginning with the fact that "the past...is only contemplated in terms of the present" (Livingstone, 1993, p. 3). There is also the business of selection, because "inevitably historians are involved in selecting from the available sources the material they deem significant in light of the problems under scrutiny" (p. 4), I will be unable to tell a whole or complete story where facts are somehow able to represent themselves, but instead, "the historian stage-manages their performance on the contemporary scene" (Livingstone, 1993, p. 5). Philo (1987) has noted " Much of what passes for the history of medicine follows a Carlyle-like path in stressing the ideas and deeds of heroic 'great men', be these doctors, learned writers or politicians who made medical reforms possible" (p. 329). In the

case of diabetes, these 'great men' are Banting and Best. But, I do strive "if not to close off such a path, at least to supplement it by establishing a medical history that recovers something of how patients themselves have thought and acted with respect to both their illnesses and their physicians" and to contribute to a "...more general project of forging a medical history sensitive to the entire milieu–economic, political, social, cultural, intellectual– in which medical thinking and practice has always been embedded.(Philo, 1987, p. 329) as it relates to diabetes. I put forth that, over time and place, different geographical locations within the body have come to be understood as the "seat" of the illness. For this analysis I will rely on literature review and Archival methods. Archival materials are a staple of historical geography and they like geography have a sorted history with colonialsism and power. The collections I drew from, The Sir Frederick Banting Papers and the Hughes (Elizabeth) Papers, are housed at the University of Toronto's Fisher Rare Book Library in Toronto, Ontario.

2 Background

Mainstream historical accounts of diabetes are well documented (Engelhardt, 1989; Tattersall, 2009), but are often too quick to fast forward to the discovery of insulin. There have descriptions of the symptoms of diabetes at least as old as the 11th centry BCE when Susruta, an Indian physician, documented the condition, which didn't receive this name until Greek physician, Aretaeus in 100 BCE. He used the Greek word, *dia-bainein* meaning "to siphon" (Sattley, 1996).

Up until the Renaissance, the medical writings of prolific Greek scholar and physician Claudius Galen (130–201 BCE) were seen as doctrine not only

in European medicine, but were also regarded in the medical practices of Persia and Arabia (Henschen, 1969). Galen wrote about the seat of the illness (diabetes), that is, where the disease was geographically located as indicated by organ names. He described diabetes as a type of dropsy and gave rise to a long held misbelief that the kidneys were responsible for the symptoms of diabetes (Henschen, 1969).

Using divisions from medical historians as provided by Sanders (2001) will prove useful in organizing some background information on diabetes. Sanders warns the reader at the beginning of his book that there is no way to provide a complete or whole history and "the omission of any event or individual's role in the history of diabetes in no way lessens the importance of that contribution" (p. xiii). Sanders (2001) names the 4 divisions of the history of diabetes, "The Descriptive Period: describing and naming the disease, The Diagnostic Period: learning how to diagnose the disease, The Experimental Period: learning what causes the disease and the Therapeutic Era: learning how to treat the disease." (p. 1), which are well accepted by medical hisotrians (Papaspyros, 1964). Sanders has also offered a fifth period, "The Era of Complications, in which we learn how diabetes causes additional health problems" (p. 1). These periods are not discrete as there are temporal and geographical overlaps. For example, 2000 years before Hippocrates, physicians in Egypt had already described diabetes and were already seeking ways to diagnose and treat the condition (Sanders, 2001).

2.1 Describing Diabetes

Egyptian physicians produced 7 papyri from 2000 BCE to 1200 BCE, one of particular interest– The Ebers (Bryan and Smith, 1974). The Ebers Papyrus was written circa 1550 BCE and describes polyuria (frequent urination that

causes dehydration and extreme weight loss) and remedies for polyuria (Bryan and Smith, 1974). While Hippocrates (460– 377 BCE), perhaps the most widely recognized Greek Physician, didn't write about diabetes specifically, he too described conditions of extreme urination and body wasting (Avicenna and Gruner, 1930).

Another Greek physician, Aretaeus (130–200 CE), who was mentored by Hippocrates and a coeval of Galen, hailed from Cappadocia, which is in modern day Turkey (Henschen, 1969). As mentioned earlier, Aretaeus is credited with using the term diabetes to describe the body as a siphon through which liquids entered and then were quickly dispelled. Aretaeus, like Galen, believed that the source of diabetes was located in the kidneys. He also believed it to be a disease of the bladder. According to Aretaeus (1856), "for the thirst there is need for a powerful remedy, for in kind it is the greatest of all sufferings; and when fluid is drunk, it stimulates the discharge of urine; and sometimes as it flows off it melts and carries away with it the particles of the body" (p. 487). This liquification of the flesh into urine is used to describe diabetes in quite a few historical medical accounts. ALthough he isn't the first to describe the pancreas, Rufus of Ephesus [1] is credited with coining the term *pancreas* (c. 100 CE): *pan* meaning all and *kreas* meaning flesh due to the organ's perceieved amorphous shape (Papaspyros, 1964).

Although Hindu medical writings described urine from a person with diabetes as honeyed well before Europeans (Frank, 1957), Western historians place emphasis on the Latin term *mellitus*, which then allows the West to claim linguistic authority over medical knowledge. The Vedic Scriptures in Sanskrit provided the basis of Hindu medical knowledge, which came to be a set of three medical textbooks known as *samhitas* and were named for 3 renowned

[1] The exact origin of the term is not known and contested (Sanders, 2001).

hindu physicians– Chakara, Susruta and Vagbhata (Frank, 1957). These texts are believed to have been written between 100 BCE and 700 CE. Many European physcians of the ancient world mistakenly identified the residue left from evaporated urine of PWD as salt instead of sugar. Hindu medicine primarily focused on prevention of diabetes and very little on the treatment of the symptoms (Frank, 1957). The treatments they did implement were unfortunately diets high in carbohydrates and emetics along with the helpful suggestion of weight reduction and plenty of exercise (Sanders, 2001). The medical writings of Chakara and Vagbhata offer 20 varieties of diseased urine or urination known as *prameha*, one of which Chakara describes the patient as losing strength, then flesh and finally the loss of a healthy complexion (Frank, 1957). While Chakara and Susruta briefly mention that insects are attracted to the urine of PWD, the writings of Vagbhata provide more detail about how diabetes is acquired, which is of importance in a medical system that focuses on prevention. *Prameha* was described by Hindu physicians as having the potential to be inherited or acquired and displaying characteristics (Frank, 1957) such as extreme thirst, obesity, chronic fatigue, obesity, recurring infections, impotence and excessive urination in both frequency and quantity (Frank, 1957).

In 3rd century BCE China, a dialogue between the Yellow Emperor and his personal minister was written and came to be widely known as the *Nei Ching* and was revised in the 8th century CE (Veith, 1950). The *Nei Ching*, beleived to be written by Huang Ti (The Yellow Emporer), is the foundation of Chinese and Japanese traditional medicine and like Hindu medicine was also prevention focused. Symptoms like insatiable thirst and abnormally frequent and copious urination make an appearance in the *Nei Ching* (Veith, 1950).

After the demise of the Roman Empire, during the middle ages of Europe,

medical concepts were based in the writings of Hippocrates and relied on understanding the four humors– blood, phlegm, yellow bile and black bile (Lloyd et al., 1983). The middle ages, for the most part, aren't known for their advances in physiology and anatomy. This vacuum of knowledge led to a robust desire to understand the composition of the human body in the centuries to come (Sanders, 2001).

During the 11th and 12th centuries two prolific physicians, Avicenna from Persia and Maimonides of Arabia, proffered new knowledge about diabetes. Avicenna (Ibn Sina) was a philosopher and physician who attempted to compile as much medical knowledge of his time into a medical textbook– the *Qanun*, which was originally written in Persian and translated into Latin in the 12th century (Avicenna and Gruner, 1930). Avicenna was held in such high regard that he was often reffered to as Galen's equal (Sanders, 2001). In the *Qanun* (The *Canon of Medicine*) Avicenna gave detailed accounts of tasting sweet urine, unyielding wounds, diabetic gangrene, and withering bodies, as well as and understanding that diabetes could either be primary or secondary (Avicenna and Gruner, 1930).

Islamic beleifs were incongruent with the practice of cadaver dissection, causing Avicenna to be somewhat lacking in his knowledge of human anatomy and giving way to his heavily philosophical understandings of medicine. Human cadaver dissection was a rare practice in Greek antiquity (**?**). According to Von Staden (1992), "the first half of the third century B.C, two Greeks, Herophilus of Chalcedon and his younger contemporary Erasistratus of Ceos, became the first and last ancient scientists to perform systematic dissections of human cadavers" (p. 223). The practice of dissecting pigs was part of human anatomy education and dissecting human cadavers didn't make a reappearance in Europe unitl the 14th century (Von Staden, 1992).

In mid to late 12th century Arabia, a rabbi, astronomer and philosopher, Moses Maimonides (Rambam) familiarized himself with the writings of Galen, which inspired his own magnum opus, *The Medical Amorphisms of Moses* (Maimonides et al., 1989). Maimonides wrote nearly 1500 aphorisms, which began with the phrase "Moses says" (Maimonides et al., 1989), as these bite sized medical principles were a tradition of medical writing that harkens back to Hippocrates (Sanders, 2001). When the term diabetes came to the scene, Maimonides pointed out that up-to-date physicians called the illness diabetes, while many others still merely described the symptoms, polydipsia (excessive thirst) and polyuria (excessive urination)' Like Galen, Maimonides located the illness within the kidneys, adding to that, the bladder. Unlike Galen's rare experience with PWD, Maimonides claimed to have encountered 20 or more people displaying symptoms of diabetes over a 10 year period (Maimonides et al., 1989). This difference led Maimonides to arrive at the conclusion that the disease was place based; he posited that diabetes was more prevalent in warmer climates (Maimonides et al., 1989).

2.2 Diagnosing Diabetes

Although the Renaissance began roughly in 14th century Europe, it wasn't until the 16th century that medicine saw a rebirth and revision of scientific concepts. Traditional medical concepts from Galen and Avicenna were no longer taken for granted, but challenged and questioned. Osler (1921), a medical historian, noted that the diagnostic period ushered in 3 essential new ways of thinking in medicine: "1) it shattered authority, 2) it laid the foundation of an accurate knowledge of human anatomy, and 3) it demonstrated how the body's functions should be studied intelligently" (p.).

2.3 Diabetic Therapy

In the 17th century the term *Mellitus*, the Latin for "honeyed," was tacked on to *Diabetes*, giving us the contemporarily used term *Diabetes Mellitus*, by a physician from London, Thomas Wills (Sattley, 1996). Wills arrived at this term through sampling his patients' urine, which, if it tasted sweet like honey, meant a diagnosis of Diabetes Mellitus. The tasting of urine[2] remained the standard for monitoring glucose levels into the 1900s (Sattley, 1996).

Physicians were all but left to watch their patients fade away. Many prescribed low-calorie diets, but little else prolonged the lives of people with diabetes until the discovery of human-consumable insulin (Ebstein, 1989). Of course this discovery didn't come without the help of companion animals (Balfe and Babinec, 2008)[3] and agricultural livestock. In 1921, Canadian surgeon, Banting, along with Best, treated a canine with diabetes by injecting extracts from a non-diabetic dog's pancreas (Zimmermann, 1989). From there they joined Drs. Collip and Macleod [4] in injecting a purer form of animal insulin into an adolescent, Leonard Thompson, whose high blood sugar lowered over the next 24 hours (Sattley, 1996).

In 1935, Hinsworth delineated something that had been understood as one illness into two types (Sattley, 1996). There are people with insulin sensitivity, but without the capability to produce insulin (Type I) and others with insensitivity, but with the capability to produce insulin (Type II). With this breakthrough research in diabetes proliferated bringing with it medical and technological innovation. Towards the end of the 1930s various kinds of beef

[2]Urine and blood are key bodily fluids for surveillance in the management of diabetes. PWD are required to take a snapshot as evidence of blood glucose level at a particular time with a blood glucose meter.

[3]See Wilkie (2013) for research on health and multi-species encounters.

[4]The Best and Banting Collections in the Fisher Rare Book Library at the University of Toronto reveals a contested claim and ownership over the patent right of insulin between Best and Banting and Macleod and Collip.

and pork insulin were developed to try and match the speed and variance of human insulin. While the livestock based insulin was a tremendous help, insulin therapy was nowhere near as effective as a human pancreas (Sattley, 1996). During the disovery of insulin in Canada, Joslin was the first doctor in the US to do comparative and complementary research on insulin therapy.

After the discovery of insulin therapy, diabetes is arguably one of the first illnesses that forced physicians to relinquish power and decision making to the patient. This has challenged "today's conventional model of doctor-patient relations–in which the former is seen as an expert professional to whom the latter must bow deferentially–actually an invention of fairly recent date" (Philo, 1987, p. 330). The physician had to trust the patient to carbohydrate count, account for exercise and propoerly dose insulin amounts based on a variety of factors. This dynamic factor of patient decision making comes in stark contrast to the aforementioned medical paridigm of physician as expert. Patients with diabetes are now having to be trusted as experts of their own illnesses.

Over the next several decades there was a proliferation of synthetic insulins, oral medications, syringes, urine test strips, glucose meters, insulin pumps, and other new technologies (Phillip and Battelino, 2012) for the treatment and management of diabetes. The drive in innovation has generally been to make these apparatuses smaller and more portable to enhance mobility, which consequently increased one-time-use (disposable) supplies[5]. With the arrival of the insulin pump and an artificial pancreas we continue on a post-human trajectory[6].

Most surviving records of people with diabetes are largely descriptive of physiological conditions rather than emotional states. There is a lack or ab-

[5]My initial analysis of the data reveals a sense of guilt associated with the amount of biomedical waste and its disposal for some PWD.

[6]See Wilson (2011) for a reflection on mobility, digital frontiers and more-than-human contact.

sence of literature and records detailing the emotional lives of PWD. The voices of patients who have been described as having the symptoms of diabetes have largely been represented by physicians and not the patients themselves. The arrival of insulin allows those with access to have a voice. These voices from the archives don't necessarily fill the void of undocumented emotional lives of the past, but their letters of extreme gratitude, expressions of hope and happiness bring to light a heretofore quiet misery.

3 The Eradication of Emotion

Boehm and Hoffmann (1878) experimented on cats whereby they observed glucose levels in the urine after exposure to several conditions. It was later found that physical pain, bondage and temperature weren't necessary ingredients for raising levels of sugar in the urine, but although Boehm and Hoffman didn't acknowledge it in their publication, emotional excitement was certainly involved. Bond (1896) published an article based on his presentation to the annual general meeting of the British Medical Association in 1896 regarding the potential relationship between diabetes, glycosuria and insanity. During Bond's study he was the Assistant Medical Officer at the London County Asylum in Banstead, from whence his research cases hailed. Of 180 recent cases (mostly male) admitted to the asylumm he observed 32 cases which showed sugar in the urine, glycosuria, some of which were from true cases of diabetes and others of unknown etiology. In the cases of glycosuria, Bond found, "in other cases of glycosuria, where no anti-diabetic treatment was adopted, and where recovery still occured, [he] was also able to point to a considerable degree of parallelism between the presence and amount of glycosuria, on the one hand, and the presence and acuteness of the mental symptoms on the

other" (p. 295). Bond subdivided the cases of true diabetes into two subcategories, those whose diabetes presented after manifestations of mental illness and those whose diabetes presented before manifestations of mental illness. In the latter, Bond believed, "the mental phenomenona were actually caused by the diabetes" (p.297). Conversely, Bond found it unlikely that glycosuria was the cause of mental symptoms in most cases (p. 299). Other medical doctors participating in the discussion portion of Bond's article mentioned the following observations. Dr. Savage thought it "common to find alternation between diabetes and insanity both in families and individuals" (p. 311) and " [has] seen a good number of patients suffering from true diabetes who, when they have become insane, have lost all the symptoms of diabetes, and when they have recovered from the insanity they have again developed diabetes" (.p 311). Savage also noted that in the cases where he had observed both diabetes and insanity in the same individual, he saw a tendancy toward particular mental illnesses, those of melancholia or dementia (Bond, 1896). Dr. Goodall (Bond, 1896) discussed the possibility that while insanity and diabetes may not be directly causative in either direction of flow, "persons suffering from diabetes undoubtedly show various morbid physical manifestation" and "are neurotic in many ways; members of neurotic families no doubt; they show hypochodriasis, irritability, sometimes excitement, mania, and so on " (p. 311). Goodall went on to posit that people with diabetes "have hysterical manifestations and mental instability, but perhaps the very fact of the family being neurotic keeps them from becoming insane, as appears to obtain in the case of so many people who have insane relatives" (p. 311). Dr. Bower (Bond, 1896) mentioned a case of a female patient who had suffered from diabetes for many years, but "no sugar was found in the urine as long as she remained maniacal...in two or three months she passed out of the maniacal state and became demented,

then the sugar reappeared" (p. 312). Cannon et al. (1911) reported "in cases of mental disease, also, states of depression have been described accompanied by sugar in the urine" (p. 280). When Boehm and Hoffman's experiment was repeated to address the emotional factors, which they had not addressed in their results other than to intimate that the designation of "Fesselungsdiabetes" was not justifiable as "emotional glycosuria" (Cannon, 1916, p.281). Their results found that pain was the contributing factor in elevated sugar levels in the cats. The discovery that "during fright (or rage?) the adrenal sectretion is increased, and the fact that injection of epinephrin gives rise to glycosuria, suggested taht glycosuria might be called forth by emotional excitement" (p. 282). When the experiment was repeated without the element of pain, an increase in sugar in the urine occurred. The work and writings of Naunyn described instances of crisis, long term anxiety and profound grief as possible causes of cases of diabetes in some individuals as well as raised sugar levels in the urine of those already known to have the disease who have experienced grave anger or fear (p. 72).

A study by Folin, Dennis and Smillie where the urine of 34 medical students (all male) was checked for the presence of sugar both before and after a major medical exam found that of those students only one had sugar in the urine both before and after the exam, whereas a total of 7 students were found to present with sugar in the urine after taking the exam. After running this experiement, they decided to run another one, based on an assumption that women were more emotional and would thusly present with more instances and/or higher levels of sugar in the urine, they tested 36 sophmores at a women's college and found that only six students presented with sugar in the urine after an examination (Bowman and Kasanin, 1929, p. 343).

Whitehorn (1934) conducted research at McLean Hospital in Waverly, Mas-

sachusetts of a 12 year period beginning in 1921 with 958 mental patients. He studied the emotional reactions of patients in relationship to blood sugar (not sugar in urine). Due to difficulty in establishing a consensus among staff in reading affect of patients for minor emotional reactions, the experiment only included major episodic emotional reactions of which there was no doubt about emotional distress (p. 988). Of the 958 mental patients, only 13 were known diabetics. According to Whitehorn (1934):

> All of these cases, when psychiatrically improved or recovered, showed some improvement in the diabetic tendency, as a decrease either in their insulin requirement, or in their necessary food restriction;... The association of mental improvement and somatic improvement raises the question as to which is the cause and which is the effect. I had expected that the administration of insulin or of a better balanced diet might improve the mental condition more especially because the patients were able to maintain or increase body weight, but experience did not justify this expectation. The depression appeared to run its course, unaffected by these aids; yet when the depression cleared the organism required less assistance from without in handling carbohydate metabolism. So far as this evidence goes, it indicates that the depressed mood itself may decrease the capacity to metabolize carbohydrates (p. 998).

Whitehorn's understanding speaks to the role of mood or emotion in diabetes as certainly correlationally and questionably causative. Cannon's work (Cannon et al., 1911) on elevated sugar levels in the urine during emotional distress is refuted by the work of Whitehorn and many contradictory research discussions are pointed out by Bowman and Kasanin (1929) (Stragnell, 1921; Miles and Root, 1922; Masson, 1923; NEILSON, 1927). Menninger (1935) conducted a thorough review of pre 1934 literature dealing with emotion and raised sugar levels in the urine and blood. He concluded "the evidence supporting the theory of emotinoal causation of glycosuria in mental disease is somewhat contradictory" (p. 2). There is a great confusion, which states

"arises in the interpretation of these various findings, not because of their very excellent chemical studies, but because of the vagueness of the specification of the emotional factors involved" (p. 2). Menninger describes a major quandry in this type of research that not only rings true in research of the early twentieth century, but remains true:

> The "emotional glycosuria" theory seems correct in the physiology of its somatic functioning but it is inadequate in the delineation of the psychic factor, namely the "emotion." That glycosuria and all the train of thalamic functioning, vegetative nervous stimulation to the adrenals, with glucose mobilization may result from psychic stimulation, is established. But it is still very much of an unsolved problem as to what the "emotion" may be. The origin of this emotion and the associations with it, which differentiate its external manifestations as "fear of death," or "anger," is entirely unsolved. Such vague general descriptive terms as "emotion" and "fear" and "anger" are as non-specific in psychiatric medicine as "cholic" and "dyspepsia" are in internal medicine. It is an unfortunate fact that in the description of an emotion as to its specificity of origin or motive, the psychiatrist is accused of talking a foreign language, and the average medical man abruptly drops the investigation at this point (p. 2–3).

Daniels (1948), a doctor in the field of psychosomatic medicine in the 1930s and 1940s explained that the lack of attention to the role of emotion in diabetes sprang from a lack of evidence supporting a relationship between war stress and an appreciable increase in diabetes cases in post-WWI soldiers:

> At this time, Joslin. . . entirely reversed an earlier tentative position that emotion might have a part in the onset and course of diabetes and issued an authoritative statement to the contrary. Chief emphasis was laid on obesity and heredity, with a complete denial that emotional factors may even significantly influence the sugar level during the course of the disease (p. 288).

This particular change of focus has greatly influenced the geneticization and biomedicalization of diabetes. Daniels's call for an attention to the role of

emotion in the onset and course of diabetes was in effect silenced by Joslin, one of the most well known names in the diabetes medical community [7]. Daniels wasn't convinced:

> A counter-current to the receding tide of medical interest in emotional factors in diabetes appeared in the reexamination of the literature and direct observation of clinical cases by psychoanalytically-oriented psychiatrists in 1935—36. Both the reevaluation of literature and the case material demonstrated unequivocally the role of emotion in the course of the disease by influencing the blood-sugar level in established diabetes. This has been further amply confirmed. Observations point in certain cases to a correlation between depression or conversion symptoms and increased sugar, and also between exhilaration and anxiety symptoms and a temporary clearing of or decrease in sugar (p. 288).

While, perhaps, at the time it was not known if emotion was or was not involved in the precipitation of diabetes, "it [had] been definitely established that emotions play a role in the fluctuation of sugar level in cases of diabetes" (**?**, p. 290). The role of emotion has been seen as more prevalent and important, particularly in the first half of the twentieth century. The bulk of research and writing arrived through psychosomatic medicine. In the late 1800s and early 1900s, there was a distinction made based on the etiology of one's diabetes. The initial presentation of diabetes after prolonged times of sorrow, anxiety and crisis was classified as emotional glycosuria. Emotional glycosuria also referred to increased sugar levels in the urine of those who already have diabetes following cases of mental illness and depression. Although medical doctors in the past and present acknowledge that emotion plays a role in the course of the illness, exactly how and to what degree has been and still is not well understood. Astutely, Burch et al. (1962) noted, "that as new understanding

[7] Joslin is still a well known name in diabetes medical research because his research legacy remains visible in clinics dedicated to diabetes research and patient treatment at the main clinic in Boston and branches throughout the US.

of the disturbed physiology of the disease has developed, or as new advances have been made in therapy, interest in the role of emotional factors has receded" (p, 131/93). While the main current focus of medical communities centers on heredity and obesity, a focus on emotion has largely fallen by the wayside, particularly in medical fields that have achieved legitimacy through their willingness to neglect the role of emotion in human health. This has created a rift in the treatment of diabetes– maintaining a split between mind and body– and has been positioned as a metabolic disorder. This mind/body split in current medical practice relies on the assumption that emotion is not bodily and vice versa. This split is furthered through a carving up of geopgraphical dilineations of the body, almost competely obscuring the concept that the mind/body dualism is a false one. The carving up of bodies, as it were, paralells that of medical disciplines and academic fields in general.

The current focus on heredity and obesity in the discourse surrounding diabetes hasn't always had the lime light. Emotion was once very much considered as part of the etiology of diabetes. As Daniels (1948) proposed, "In seriously considering emotional conflict in the etiology, it is not necessary to discard facts relating either to heredity or obesity, as both appear of great clinical importance and must be included in any calculation" (p. 289). While we acknowledge that food is a major factor in diabetes, we neglect the emotional and cultural connections to food as agents of belonging and identity. Historically the prime way of treating diabetes invovled a restricted diet, which in conjunction with polyuria, lead to dangerously low body weights. Throughout the history of diabetes research body size has certainly taken up its fair share of ink, paper and computer screens, but is in most instances deployed to reify the notion that obesity is the main culprit of Type 2 diabetes and that people with Type 1 diabetes should be or are typically thin (add archival letter from

dr to Banting about his female T1D patient struggling with weight gain). The many cases of people with Type 2 being thin and cases of people with T1D as larger are severely overlooked.

Contemporarily, it is rare that a physician takes into account the emotional factors in the course of diabetes (among other illnesses). Because diabetes is a dynamic disease, there has been a turn in North America to address this complexity with professionals called certified diabetic educators (CDE). Depending on where you are, what type of health care you have and your level of mobility influences your access to a CDE. The current model of treatment relies on the individual requisitioning a team of doctors and professionals, thereby splitting one's own person into compartments based solely on the bodily geographic location of symptoms or secondary problems. This team often consists of a family doctor, an endocrinologist, an opthamologist, a nutritionist or dietician, a podiatrist, and a gynocologist (for women). Oddly, although men's sexual and reproductive health is also affected by diabetes, it is almost unheard of that they are approached about these topics outside of written information plastered on walls and layed out on waiting room tables, let alone are men encouraged to broach this subject with medical professionals.

Interestingly in the last hundred years we have seen people desperate for insulin therapy (as seen in the letters to Drs. Banting and Best) and have come full circle to a phenomenon called diabulima, whereby one restricts insulin intake in order to lose weight or to maintain a lower weight. Much like Anorexia Nervosa or Bulimia, receiving compliments on one's weight or appearance after practicing diabulima only serves as a positive reinforcement to continue underuse of insulin. Likewise the ability to eat almost anything and not gain weight, as well as not having to pay for insulin and use needles to inject it makes diabulimia all the more appealing. This highly emotional

practice serves to play into a vicious cycle of hormonal undulations, which in turn leads to self-loathing and shame, while simultaneously garnering societal approval.

While there seemed to be a trend toward understanding causal and correlational relationships between emotion and diabetes, this trend faded with the rise of a focus on obesity, medicalization and genetics. Only now in and after the affective turn do we again see a rise in interest between the two. The quantification of this disease has paralleled a trend in quantifying the self (Lupton, 2013), which I will explore in the next chapter. From the calorie counting of starvation diets before the discovery of insulin to historical and current practices of carbohydrate counting (as seen in Hughes' correspondance), quantifying carbohydrate to insulin unit ratios, measuring blood sugar and BMIs, diabetes requires an extreme self quantification with constant data collection, consideration and analysis. Technology propels us toward an ever increasing quantified exisitence (Lupton, 2000), which is most certainly bound up with an everyday emotional experience of ourselves and the world.

4 Annotations and Quotes

Medical and academic literature regarding diabetes produced from the 1930s through the 1970s is saturated with snippets of biological and environmental determinism, which ultimately allowed the baby to be thrown out with the bath water.

1. "The prevailing features in this class of case seem to be melancholia —an exaggeration of that frequently associated with non-insane diabetics —accompanied by delusions, these either of persecution, or visceral ones, the latter being possibly mistinterpretations of real bodily discomfort

attendant on the presence of diabetes" (Bond, 1896, p. 297)

2. (Major, 1933) One of Hippocrates disciples, Aretaeus, is attributed with the first use of the word *d*iabetes in connection with a description of symptoms associated with diabetes. This is generally accepted, but not without criticism.

3. (Fishbein, 1959) In medical resources and literature geared towards women in the 1950s and 60s mention diabetes in several contexts: According to McKusick (1959), "Babies born of mothers with diabetes are much more likely to suffer from respiratory distress after birth than if the mother did not have the disease" (p. 4), which almost reads as a warning to not reproduce if you have diabetes.

5 Archival Data

Part of Sir Frederick Banting Collection contained laboratory notes on the dogs used to test out different extracts. The dogs were depancreatized and then injected with various concontions of a sort of blended up pancreas extract. The following examples of laboratory notes actually record the emotional state of the dogs, which is in stark contrast to clinical notes on human patients (completley lacking any note of emotional or mental well being). Perhaps this is a result of human understandings of animals as lacking rational intelligence and wholly reliant on instinct and a less 'controllable' emotional existence.

MS Collection 76 Box 6B Folder 1 Aug. 11 contd 1921 10AM /CHB/ Dog 409 not feeling so well. Blood sugar .30 Dog 92- feeling better. Not groaning, but still labored breathing- well formed stool 8cc extract Blood sugar .21

10PM /FGB/ Dog 409 Blood sugar - .30 dog in good spirits Dog 92 Blood Sugar -.30 Condition improving steadily. No vomiting, abominal grunt and

labored breathing ceased. Dog in good spirits 12cc of extract given 4cc of which went subcutaneous

Aug 15, 1921 Dog 92 9:00PM Dog peevish Aug 16 10:00AM Blood Sugar - .30 Dog is in fair spirits Aug 17 Dog 92 10:00AM Dog's spirits improved as leg is not so sore 3:00PM Dog in excellent spirits

Elizabeth Hughes was a patient of Dr. Allen of New York and came to be treated by Banting via Dr. Joslin. She was the daughter of a wealthy, political family, which afforded her access to insulin very early on. He father Charles Evans Hughes served as the Governor of New York from 1907-1910, an Associate Justice of the Supreme Court and later became the Secretary of State from 1921-1925. Elizabeth, like many people of means with chronic illness in the late 19th and early 20th centuries, headed for warmer, tropical climates in hopes of improving their health. Elizabeth spent time in Bermuda beginning in 1922.

MS Collection 00334 Box 1 Folder 13 January 8, 1922 Letter from Elizabeth Hughes to Mrs. Charles Evans Hughes, mailed from Bermuda to Washington, D. C. "I am getting along beautifully now on the new diet and am not feeling the change any in strength at all. In fact I really feel better than when I was on a high caloric diet and‘ showing traces all the time. I fear the excitement of Nov. did it, but I wouldn't have missed it for anything, but I don't want another excitement like it to upset me again. Mrs. B is planning to raise my carbohydrate again, slowly but surely, if everything goes 'bien' till then after my next fast day and , as far as my tests go now I'll be able to stand it alright, she feels sure."

MS Collection 00334 Box 1 Folder 15 January 15, 1922 Letter from Elizabeth Hughes to Mrs. Charles Evans Hughes, mailed from Bermuda to USA Elizabeth requests her mother to bring "a couple of tins of beef sterile cubes"

and a "pound box of agar" when she comes to Bermuda to visit her.

MS Collection 00334 Box 1 Folder 16 January 22, 1922 Letter from Elizabeth Hughes to Mrs. Charles Evans Hughes, mailed from Honeymoon Cottage in Bermuda to USA "I'm doing just what I expected to do down here, as you can see~~m~~ an out-of-door life and it's already doing me good. I do feel so well here, and my diet seems to be going finely now, and we're slowly increasing my carbohydrate as Blanche has probably written you about in detail. I'm actually on 12 grams today and I haven't been on that for ages you know!"

MS Collection 00334 Box 1 Folder 17 January 29-30, 1922 Letter from Elizabeth Hughes to Mrs. Charles Evans Hughes, mailed from Honeymoon Cottage in Bermuda to USA "...and also Blanche needs some things for the tests, small bottles, which I'm enclosing a list of and, which you will also bring with you...I'm feeling great these days and we've been able to increase my carbohydrate from 7 to 12 grams, but as I showed a slight trace on 13, I guess I'm not quite equal to that much yet a-while, but nevertheless a raise of 5 grams at a time is nothing to sniff at, and in a few weeks after I've gotten thoroughly accustomed to 12, we'll try once more. I just adore my diet now. We arrange it on all 3 meals cutting out my egg-nog and I like it much better."

MS Collection 00334 Box 1 Folder 18 February 5, 1922 Letter from Elizabeth Hughes to Mrs. Charles Evans Hughes, mailed from Honeymoon Cottage in Bermuda to USA " I keep thinking everyday, how lucky I am to be down here away from all epidemics and cold, where we only get tropical rains, and again, I want to tell you how grateful I am to both you and father for this wonderful opportunity which will remain with me during my whole life. And it certainly is doing me good, for everybody speaks to me about how much better I'm looking than when they saw me last ...You'll be surprised when I tell you I've changed my diet again, and have now commenced taking some

vegetables, fruit etc. again and I feel it's going to do me good. I need vitamins you know, and I 've been on that concentrated diet for so long, the exact same thing everyday that we thought the time had come to change, so now I'm really having a wonderful time for not having touched a thing like that for a year. I naturally relish it for instance, today I'm eating for breakfast 5 grams of oatmeal with 20 grams of cream on it and an omelet. For my picnic lunch 75 of cold lamb, 30 of lettuce, cocoa made with 20 of cream and my baked custard made of 40 of cream and an egg. Tonight I get an omelet, 20g of lettuce and cocoa made with 60g of milk. Isn't that a swell menu though and you've no idea how good it tastes !? I'll keep my breakfast always the same, but I'll take a little of spinach, celery, and those low 5% vegetables and fruits. Increasing my carbohydrate in vegetables etc. Blanche says she thinks I'll stand better than in milk on account of the milk-sugar you see, well I guess I will and in a few weeks if this goes alright will try again, in that way you see now my diet is 45 of protein, 56 of fat 12 of carb, 750 calories for 4 days of the week then the day before my fast day, we reduce the carbs to ten grams daily. I feel fine these days, so much better than I did in Wash [D.C.] and I sleep marvelously. . . and another thing, I'm going to take a daily rest after lunch, even though I don't get up till ten or so, and that with not exercising quite so much is doing me lots of good for I certainly must be looking better if everybody mentions is, n'est-ce-pas?"

MS Collection 00334 Box 1 Folder 19 March 10, 1922 Letter from Elizabeth Hughes to Mrs. Charles Evans Hughes, mailed from Honeymoon Cottage in Bermuda to USA "Dearest Family, I'm really feeling like myself again these days and my eye of course is absolutely fully recovered, it was about last Tuesday, but I had a miserable cough that held on a long while keeping me awake at night etc. but now due to some fine cough medicine the Doctor gave

me it's disappeared, and I as I say, I'm myself once more, only being extremely careful in every way. . . my diet's fine and so am I."

MS Collection 00334 Box 1 Folder 20 March 13, 1922 Letter from Elizabeth Hughes to Mrs. Charles Evans Hughes, mailed from Honeymoon Cottage in Bermuda to USA "No sooner am I fully recovered from one thing, something else seems to happen, and in this last case I consider myself extremely lucky. Last night as we were getting supper, I entered the dining room with both hands full of dishes, (bread in one, bacon in the other), when I caught my foot in the rug and stumbled and fell, knocking myself very hard into the chair at the table so that I broke my glasses, and got an ugly cut right next to my eye . . ."

MS Collection 00334 Box 1 Folder 24 March 31, 1922 Letter from Elizabeth Hughes to Mrs. Charles Evans Hughes, mailed from Honeymoon Cottage in Bermuda to USA "Everybody says I'm looking better and I sure do feel fine am gaining slowly but surely in strength, although remembering what you said and am not taxing it to its utmost as you said, but am curbing myself like a good, obedient daughter that I am, although it goes against my poor '[illegible]' most terribly. I feel I'm terribly lazy."

MS Collection 00334 Box 1 Folder 25 April 3, 1922 Letter from Elizabeth Hughes to Mrs. Charles Evans Hughes, mailed from Honeymoon Cottage in Bermuda to USA "Well I've got some good news for you, I've been on 13 grams of carbohydrate all week and have stood it perfectly so tomorrow (this being my half-day) we'll try 14 grams. I have a hunch I'll be able to stand that too, although I don't know of course, but I have a feeling my blood-sugar's really down now, and I have hope it'll stay!"

MS Collection 00334 Box 1 Folder 26 April 10, 1922 Letter from Elizabeth Hughes to Mrs. Charles Evans Hughes, mailed from Honeymoon Cottage in

Bermuda to USA She is up to 15 g of carb and eating a wider variety of food.

MS Collection 00334 Box 1 Folder 27 April 14, 1922 Letter from Elizabeth Hughes to Mrs. Charles Evans Hughes, mailed from Honeymoon Cottage in Bermuda to USA "I'm having 16 grams of carbohydrate, having stood my 15 absolutely as perfectly as I could. I'm beginning to feel hopeful now, and we're going to find out my tolerance then keep me on that until I get home and have a blood-test by Dr. Allen himself, after I'm entirely rested. But I don't think the trip will hurt me at all this time, because it was nothing before, but my terribly upset condition at the time. I was probably showing sugar from the time I left Wash. until I got down here! I'm on more carbohydrate now, did you stop to realize, than I've been on for a year and a half and am in much better condition otherwise too. I'm eating every kind of food now, like grapefruit, strawberries, tomatoe, fish, and as you see they are all agreeing with me marvelously."

MS Collection 00334 Box 1 Folder 29 April 21, 1922 Letter from Elizabeth Hughes to Mrs. Charles Evans Hughes, mailed from Honeymoon Cottage in Bermuda to USA "I'm feeling and looking much better, and am having perfectly delicious things to eat and such a variety. It's tood good to be true almost."

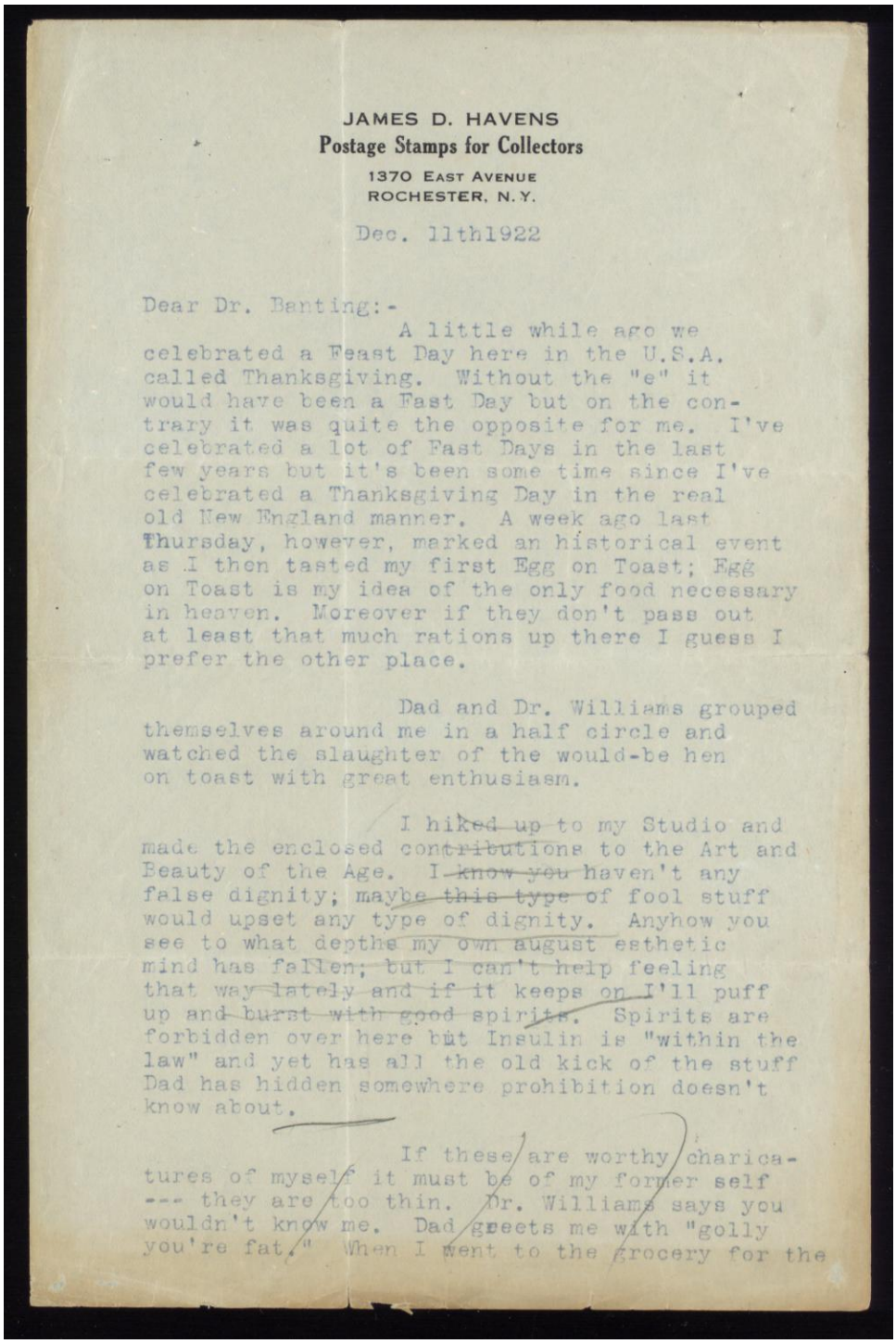
MS Collection 00334 Box 1 Folder 30 April 24, 1922 Letter from Elizabeth Hughes to Mrs. Charles Evans Hughes, mailed from Honeymoon Cottage in Bermuda to USA "...'slowly but surely' being our motto...and just think-what a difference 8 grams will make in my diet all of a sudden, you see we've gone from 12 to 20 this timeand I feel very happy, proud and encouraged, for I feel quite sure I'll be able to tolerate the 20 all right, don't you?"

MS Collection 00334 Box 1 Folder 31 April 28, 1922 Letter from Elizabeth Hughes to Mrs. Charles Evans Hughes, mailed from Honeymoon Cottage

in Bermuda to USA "I've at last reached my goal, and am on 20 grams of carbohydrate today for the first time. . . just think what a difference this makes in my diet and in me, for I'm beginning to feel more energy all the time and everybody says grow to looking better each time they see me- so there 'ain't it a grand & glorious feelin though?' "

MS Collection 00334 Box 1 Folder 32 May 16, 1922 Letter from Elizabeth Hughes to Mrs. Charles Evans Hughes, mailed from Honeymoon Cottage in Bermuda to USA "I'm certainly feeling all myself again in every way but my strength anf I won't try to conceal to you what an awfully hard blow I sure did get in that respect, although Blanche says it was to be expected. . . I'm still very weak. . . Now I'm taking 5 grams of carbohydrate on my fast day, which makes a whole lot of difference to me as you can imagine. . . so you see my 'pancreas' wasn't effected one one bit thank goodness." In this letter she goes on to discuss a clip from the newspaper about insulin (which was praised by Joslin). Blanche Burgess also writes in the letter about Elizabeth's weakness and mentions the newspaper clipping as well, "I am much interested in the clipping you sent her. It appears the doctors are at last really finding a cure for diabetes."

James Havens was a patient of Dr. Williams of Rochester, NY. He is known as the first American from the United States to receive insulin treatment. Williams came to know of insulin therapy from a friend whose golf partner was aquainted with men in the School of Medicine at the University of Toronto. It seems in the world of insulin, the same things remain important as in the rest of life– who you know and where you are.



JAMES D. HAVENS
Postage Stamps for Collectors
1370 East Avenue
Rochester, N.Y.

Dec. 11th1922

Dear Dr. Banting:-

A little while ago we celebrated a Feast Day here in the U.S.A. called Thanksgiving. Without the "e" it would have been a Fast Day but on the contrary it was quite the opposite for me. I've celebrated a lot of Fast Days in the last few years but it's been some time since I've celebrated a Thanksgiving Day in the real old New England manner. A week ago last Thursday, however, marked an historical event as I then tasted my first Egg on Toast; Egg on Toast is my idea of the only food necessary in heaven. Moreover if they don't pass out at least that much rations up there I guess I prefer the other place.

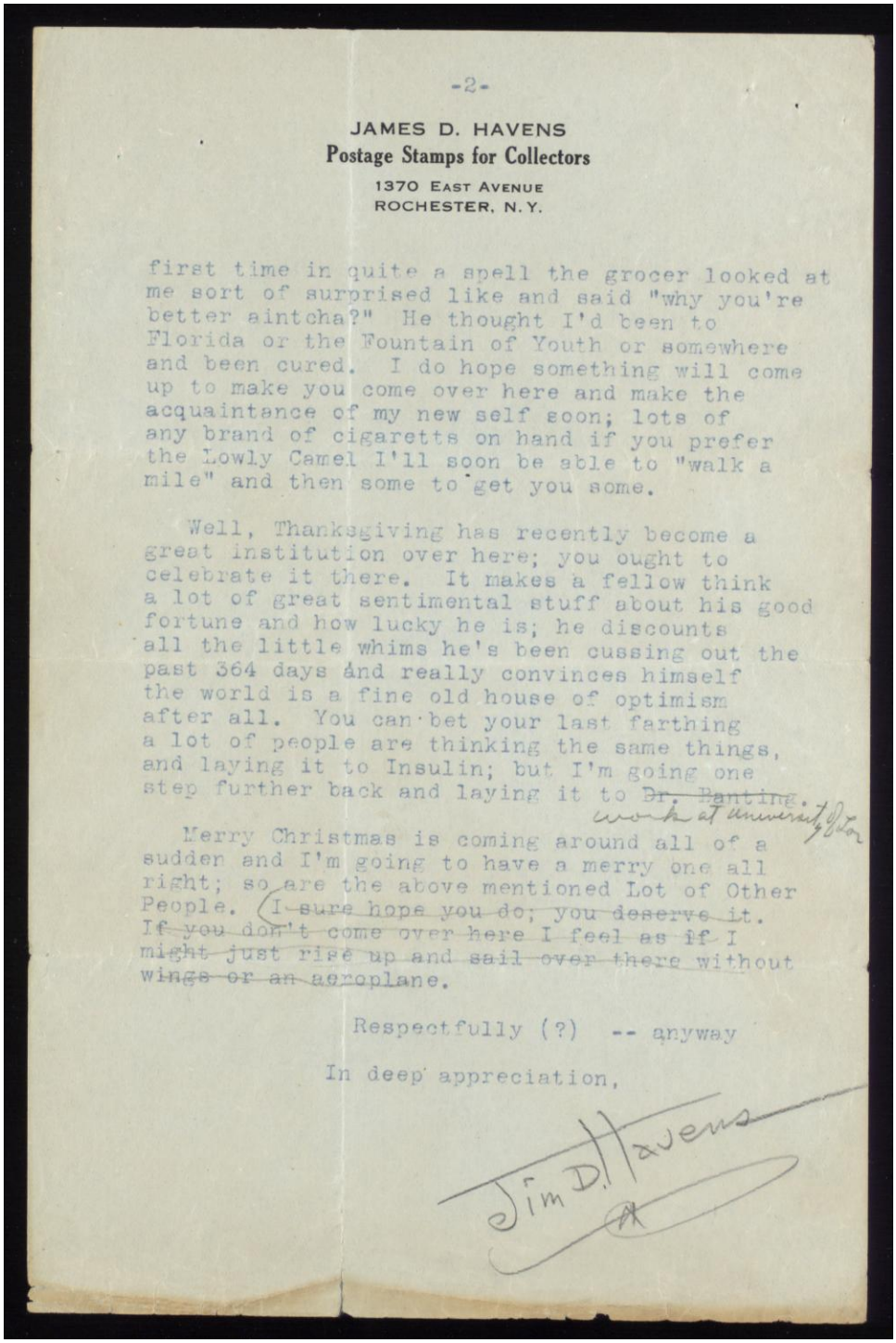
Dad and Dr. Williams grouped themselves around me in a half circle and watched the slaughter of the would-be hen on toast with great enthusiasm.

I hiked up to my Studio and made the enclosed contributions to the Art and Beauty of the Age. I know you haven't any false dignity; maybe this type of fool stuff would upset any type of dignity. Anyhow you see to what depths my own august esthetic mind has fallen; but I can't help feeling that way lately and if it keeps on I'll puff up and burst with good spirits. Spirits are forbidden over here but Insulin is "within the law" and yet has all the old kick of the stuff Dad has hidden somewhere prohibition doesn't know about.

If these are worthy charicatures of myself it must be of my former self --- they are too thin. Dr. Williams says you wouldn't know me. Dad greets me with "golly you're fat." When I went to the grocery for the

Figure 1: Letter from James Havens to Dr. Banting (December 11, 1922)

The following primary source material is from the Bating Collection (MS COll 76) in Fisher Rare Book Library at the University of Toronto as well



-2-

JAMES D. HAVENS
Postage Stamps for Collectors
1370 East Avenue
ROCHESTER, N.Y.

first time in quite a spell the grocer looked at me sort of surprised like and said "why you're better aintcha?" He thought I'd been to Florida or the Fountain of Youth or somewhere and been cured. I do hope something will come up to make you come over here and make the acquaintance of my new self soon; lots of any brand of cigaretts on hand if you prefer the Lowly Camel I'll soon be able to "walk a mile" and then some to get you some.

Well, Thanksgiving has recently become a great institution over here; you ought to celebrate it there. It makes a fellow think a lot of great sentimental stuff about his good fortune and how lucky he is; he discounts all the little whims he's been cussing out the past 364 days and really convinces himself the world is a fine old house of optimism after all. You can bet your last farthing a lot of people are thinking the same things, and laying it to Insulin; but I'm going one step further back and laying it to ~~Dr. Banting~~ work at univers[illegible] Dr.

Merry Christmas is coming around all of a sudden and I'm going to have a merry one all right; so are the above mentioned Lot of Other People. ~~I sure hope you do; you deserve it. If you don't come over here I feel as if I might just rise up and sail over there without wings or an aeroplane.~~

Respectfully (?) -- anyway

In deep appreciation,

Jim D. Havens

Figure 2: Letter from James Havens to Dr. Banting P. 2 (December 11, 1922)

as the University of Toronto Archives. On Decemeber 15, 1922, one of Dr. Josilin's patients, Richard Witner, sent a letter to Banting from Rock Hill, South Carolina, which expresses gratitude for the impact insulin has had on his life: "As long as I live I'll think of you with the greatest gratitude. You have saved the lives of so many and given happiness to diabeteics all of the world." Here, Witner does not merely acknowledge the saving of lives in a medical or physical sense, but also recognizes the impact on the emotional lives of PWD the world over.

Helen Zualey, another of Joslin's patients, wrote to Banting from her Portland, Maine home on December 14, 1922. She wrote, "Thru your wonderful discovery of insulin [I] am able to enjoy one of the best things I have been deprived of, namely a good diet. I feel like a different girl." Here Helen brings up one of the emotional relationships regarding diabetes, that is, the human relationship to food.

Richard Lester of Savannah, Georgia wrote to Dr. Banting on January 26, 1923 to describe his daughter's state before using insulin: "In the meantime, the child who is of a very happy nature, and extraordinarily bright, became dazed, and took no interest in anything." Richard goes on to describe his daughter after being treated with insulin: "the patient was sitting up in bed singing and playing with her toys. In 48 hours she was up. While still emaciated, she is apparently herself."

Elise Downing Spinar write to Bating about her husband on June 25, 1924. She described his state: "Until about 2 months ago he has carried on fairly well despite a very active life. Then he had a complete breakdown, lost weight rapidly and found he was suffering from acetone poinsoning." Elise's husband went to Duff House in Scotland for treatment and "now he finds that with injecting insulin twice a day that he is able to absolutely control the acetone

and sugar, and from a nervous wreck he seems to be strong, vigorous and altogether a different man." This letter illustrates how one becomes a "nervous wreck" when living with diabetes.

Greta Rudberg of Sweden sent a letter written on September 15, 1925 to Banting describes her son's state after using insulin: "Not only is his life thereby saved but he is as well, happy and full of life as any sound child." She makes a point to go beyond gratitude for saving his life and speaks to the quality of his emotional life.

Ruth Henry of New York (January 6, 1928) wrote to Banting, "I would venture to tell you of one rich and joyous life that had returned from the Valley of the Shadow as a result of your work. Now here I am, a normal happy and I even hope useful individual in the strenuous life a rural parsonage, glad to be alive and grateful to you."

In the late 1920s, after the wider spread and availability of insulin, there were some who began to notice various concerns. John Comyn of Kent, England wrote, "I do not wish to seem ungrateful for I am most grateful for what you have already done in the research line; but injections at the rate of 3 per day every day of one's life become wearying and depressing at times" (December 1, 1929).

Alice Faulkner of Selma, Alabama wrote to Banting on January 2, 1929 about her daughter with diabetes, " The doctors here are more afraid of the harm that the insulin will do than they are aware of the good it does." This shows a glimpse into the emotional risk taken on by Physicians administering insulin for the first time, perhaps fearful of causing hypoglycemia. Alice described her daughter after the use of insulin, "In fact, she has more life and 'pep' than anyone I know of."

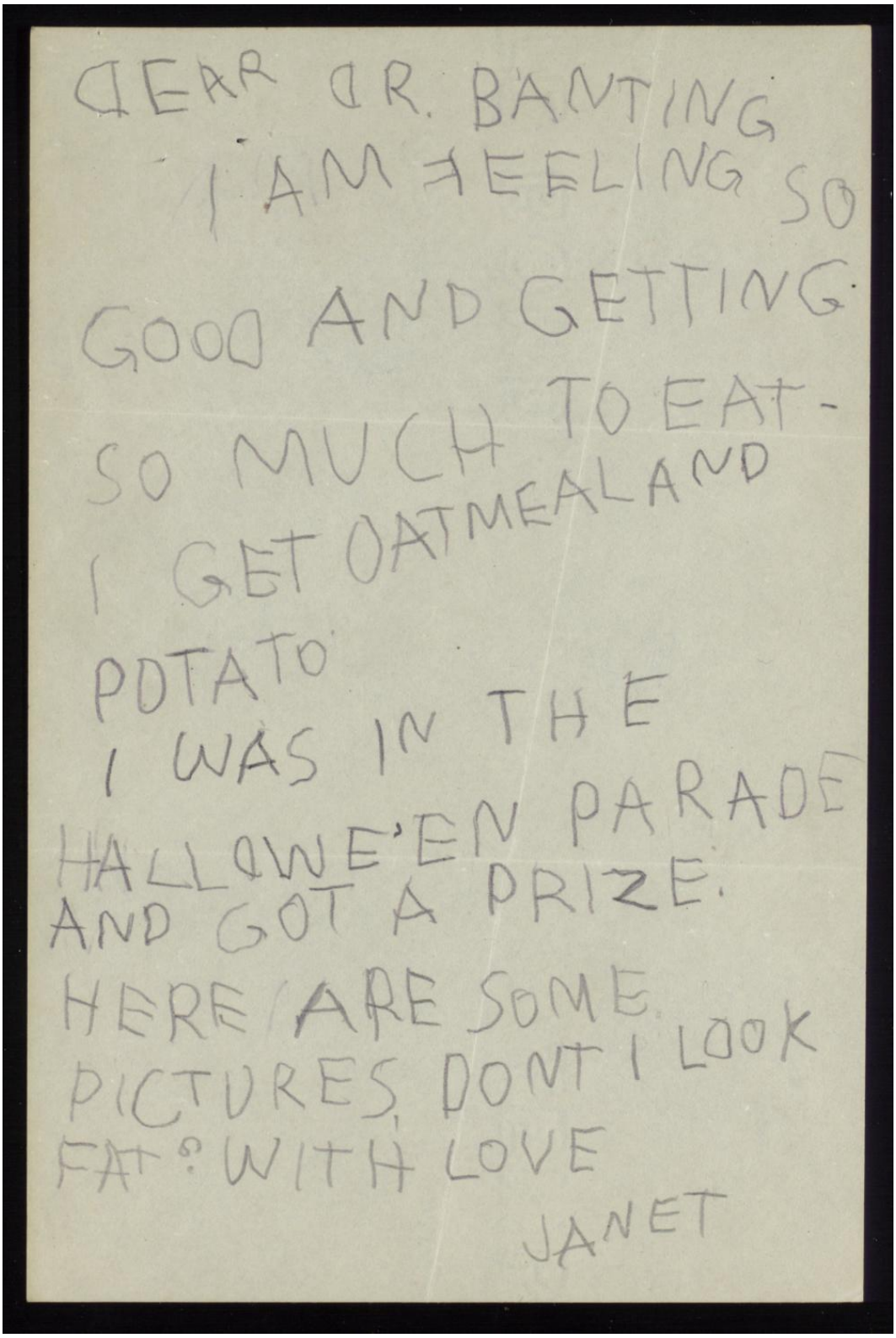


Figure 3: Letter to Dr. Banting from Janet

The introduction of insulin into medicine was by a group of men at the University of Toronto, who then sent the recipes to a group of men at Eli Lilly Corp for improvemnet, production and distribution.

In the following letter, Dr. Woodyatt writes to Dr. MacLeod to update him on the improvement of his patients with diabetes. One patient stands out to him among the rest:

> We have one man appeared to be incapable of burning more than 46 g. of glucose, whose power to burn has increased by 33 g. for each cc. of this same preparation. I think that this striking improvement is due in part to the tremendous relief of mental depression that it was for this man to find that his condition was not hopeless and that he could again take a comfortable diet... Diabetics are extremely sensitive to psychic influences, and I have seen in the past many cases whose actual severity varied tremendously in response to such things[8]

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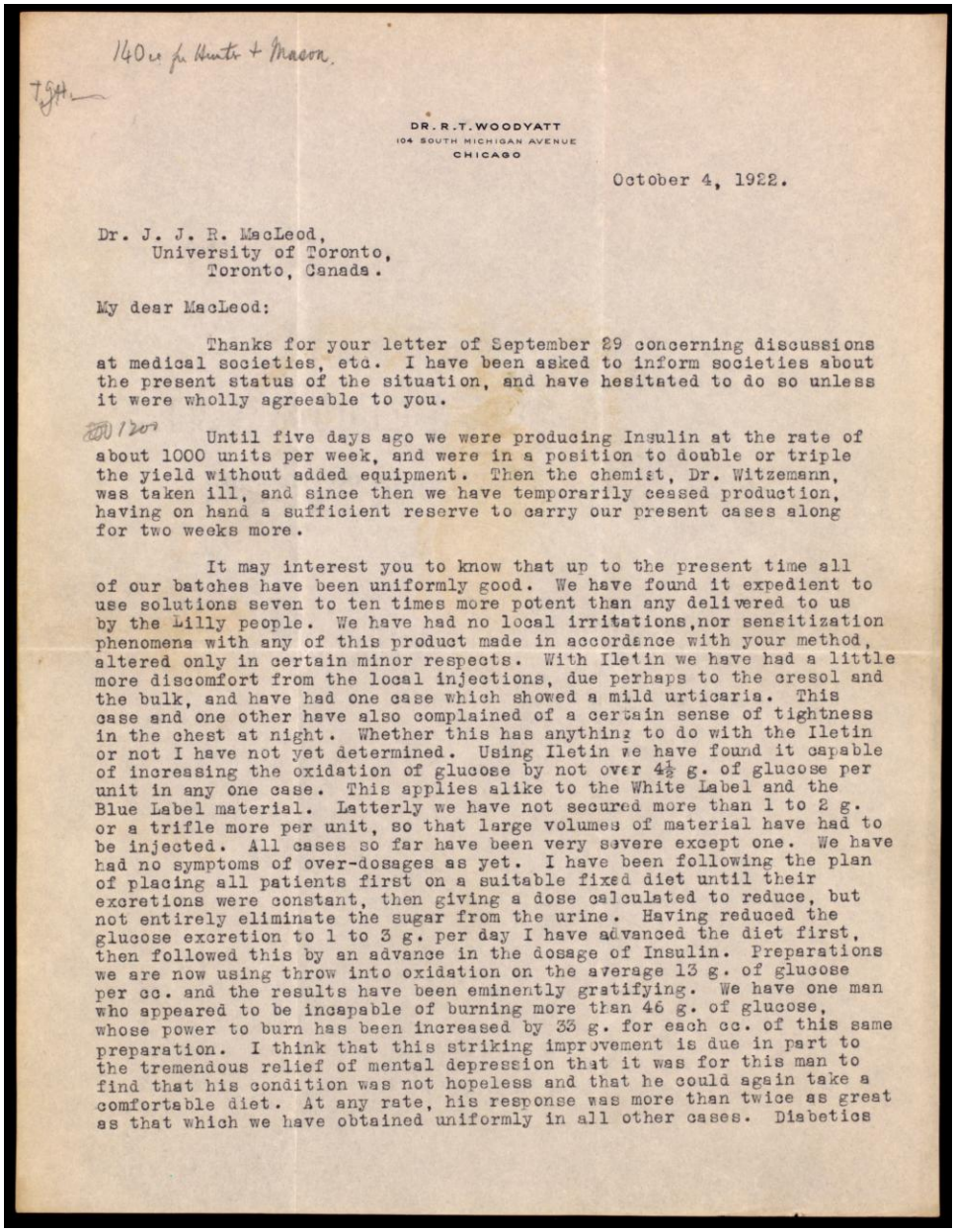
[8]Letter to Dr. MacLeod, October 4 1922. University of Toronto Archives, A1982-0001, Box 15, Folder 4



140 cc to Hunter + Mason.

TJH

DR. R. T. WOODYATT
104 SOUTH MICHIGAN AVENUE
CHICAGO

October 4, 1922.

Dr. J. J. R. MacLeod,
University of Toronto,
Toronto, Canada.

My dear MacLeod:

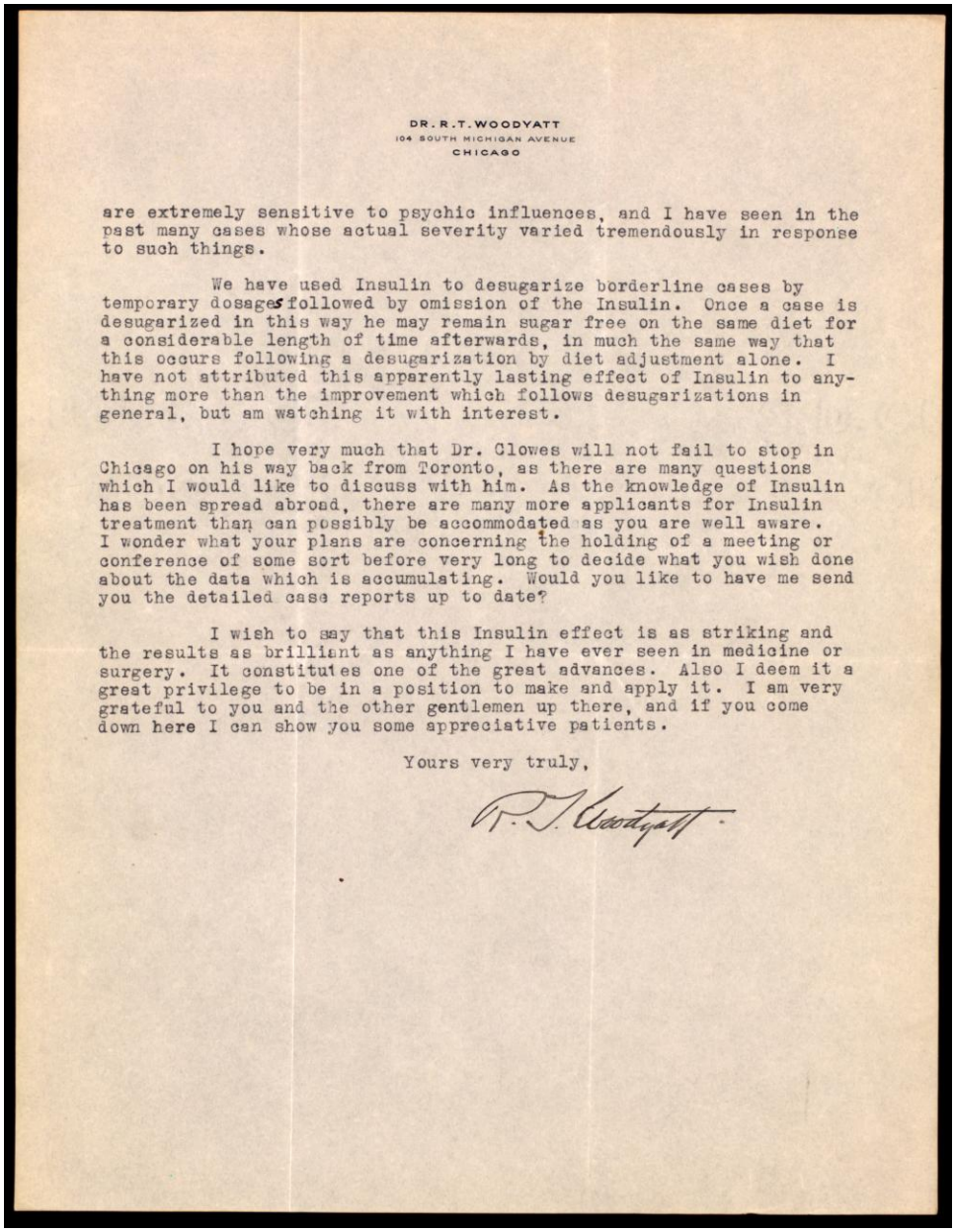
Thanks for your letter of September 29 concerning discussions at medical societies, etc. I have been asked to inform societies about the present status of the situation, and have hesitated to do so unless it were wholly agreeable to you.

200/20?

Until five days ago we were producing Insulin at the rate of about 1000 units per week, and were in a position to double or triple the yield without added equipment. Then the chemist, Dr. Witzemann, was taken ill, and since then we have temporarily ceased production, having on hand a sufficient reserve to carry our present cases along for two weeks more.

It may interest you to know that up to the present time all of our batches have been uniformly good. We have found it expedient to use solutions seven to ten times more potent than any delivered to us by the Lilly people. We have had no local irritations, nor sensitization phenomena with any of this product made in accordance with your method, altered only in certain minor respects. With Iletin we have had a little more discomfort from the local injections, due perhaps to the cresol and the bulk, and have had one case which showed a mild urticaria. This case and one other have also complained of a certain sense of tightness in the chest at night. Whether this has anything to do with the Iletin or not I have not yet determined. Using Iletin we have found it capable of increasing the oxidation of glucose by not over 4½ g. of glucose per unit in any one case. This applies alike to the White Label and the Blue Label material. Latterly we have not secured more than 1 to 2 g. or a trifle more per unit, so that large volumes of material have had to be injected. All cases so far have been very severe except one. We have had no symptoms of over-dosages as yet. I have been following the plan of placing all patients first on a suitable fixed diet until their excretions were constant, then giving a dose calculated to reduce, but not entirely eliminate the sugar from the urine. Having reduced the glucose excretion to 1 to 3 g. per day I have advanced the diet first, then followed this by an advance in the dosage of Insulin. Preparations we are now using throw into oxidation on the average 13 g. of glucose per cc. and the results have been eminently gratifying. We have one man who appeared to be incapable of burning more than 46 g. of glucose, whose power to burn has been increased by 33 g. for each cc. of this same preparation. I think that this striking improvement is due in part to the tremendous relief of mental depression that it was for this man to find that his condition was not hopeless and that he could again take a comfortable diet. At any rate, his response was more than twice as great as that which we have obtained uniformly in all other cases. Diabetics

Figure 4: Letter from Dr. R.T Woodyatt to Dr. MacLeod (October 4, 1922)



DR. R.T. WOODYATT
104 SOUTH MICHIGAN AVENUE
CHICAGO

are extremely sensitive to psychic influences, and I have seen in the past many cases whose actual severity varied tremendously in response to such things.

We have used Insulin to desugarize borderline cases by temporary dosages followed by omission of the Insulin. Once a case is desugarized in this way he may remain sugar free on the same diet for a considerable length of time afterwards, in much the same way that this occurs following a desugarization by diet adjustment alone. I have not attributed this apparently lasting effect of Insulin to anything more than the improvement which follows desugarizations in general, but am watching it with interest.

I hope very much that Dr. Clowes will not fail to stop in Chicago on his way back from Toronto, as there are many questions which I would like to discuss with him. As the knowledge of Insulin has been spread abroad, there are many more applicants for Insulin treatment than can possibly be accommodated as you are well aware. I wonder what your plans are concerning the holding of a meeting or conference of some sort before very long to decide what you wish done about the data which is accumulating. Would you like to have me send you the detailed case reports up to date?

I wish to say that this Insulin effect is as striking and the results as brilliant as anything I have ever seen in medicine or surgery. It constitutes one of the great advances. Also I deem it a great privilege to be in a position to make and apply it. I am very grateful to you and the other gentlemen up there, and if you come down here I can show you some appreciative patients.

Yours very truly,

R. T. Woodyatt

Figure 5: Letter from Dr. R.T Woodyatt to Dr. MacLeod P. 2 (October 4, 1922)

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