

# FitzPatrick Lecture: King George III and the porphyria myth – causes, consequences and re-evaluation of his mental illness with computer diagnostics

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## ABSTRACT

Recent studies have shown that the claim that King George III suffered from acute porphyria is seriously at fault. This article explores some of the causes of this misdiagnosis and the consequences of the misleading claims, also reporting on the nature of the king's recurrent mental illness according to computer diagnostics. In addition, techniques of cognitive archaeology are used to investigate the nature of the king's final decade of mental illness, which resulted in the appointment of the Prince of Wales as Prince Regent. The results of this analysis confirm that the king suffered from bipolar disorder type I, with a final decade of dementia, due, in part, to the neurotoxicity of his recurrent episodes of acute mania.

**KEYWORDS:** Acute intermittent porphyria, bipolar disorder, computer diagnostics, King George III, senile dementia, variegated porphyria

*A professional is a man who can do his job when he doesn't feel like it.*

*An amateur is a man who can't do his job when he does feel like it.*

HS Torrens (2006)<sup>1</sup>

## Introduction

The lengthy reign of King George III (1760–1820) coincided with a succession of important military and political events, including the loss of the American colonies, the defeat of Napoleon, the development of the Industrial Revolution and the founding of the British Empire. Historians have discussed, at length, the role of George III in the decisions leading to these and other events. The nature of his recurrent ill health is clearly relevant, but, surprisingly, has been little explored by professional historians, who have been content to follow the views of the porphyria claimants despite their limited

training in historical methods and modern medical diagnostic techniques.

## Background

The amateur historians Ida Macalpine and Richard Hunter initially claimed a diagnosis of acute intermittent porphyria as the cause of King George III's recurrent mental illness, which they later changed to the rarer and milder variegated porphyria.<sup>2,3</sup> My colleagues and I have shown these diagnoses to be unsustainable in studies that were reported in this journal in 2011 and elsewhere<sup>4–7</sup> and that were recently highlighted in an article relating to George III by John Cannon in the *Oxford dictionary of national biography*.<sup>8</sup> In spite of these reports, recent publications have cited claims of porphyria as the definitive cause of the king's illness. The recent exhibition on Georgian London at the British Library and the associated guide book<sup>9</sup> both highlight porphyria as the cause of the king's illness, and recent correspondence with the relevant library curator confirms the British Library's unwavering adherence to the porphyric claims, although the contradictory evidence is on their own shelves! Similarly, a recent visit to Kew Gardens – the grounds of Kew Palace, which was the focus for the king's illness in 1788–9 – identified the diagnosis of porphyria in the palace itself, the guide book<sup>10</sup> and the welcoming greetings of the guides.

Reasons for the persistent adherence to the claims of porphyria are unclear. Following Macalpine and Hunter's publications in the *British Medical Journal* in 1966 and 1968,<sup>2,3</sup> their claims were challenged by authorities on porphyrin from the UK and abroad on the basis of clinical, laboratory and genetic evidence.<sup>11</sup> However, Macalpine and Hunter garnished support from distinguished physicians, fellows of the Royal Society and even the Nobel laureate Hans Krebs. Non-medical historians past and present, including Alan Bennett, Jeremy Black, John Brooke, Antonia Fraser and Roy Porter, have enthusiastically adopted Macalpine and Hunter's diagnosis, clearly without detailed reading of the more than 100 volumes of medical notes concerning George's illnesses. In contrast, medical historians with an interest in psychiatry – including Arnold Chaplin, the FitzPatrick Lecturer of 1917–18 – have all, since the first study in 1831, clearly shown a diagnosis of bipolar disorder (or the contemporary synonym).<sup>12</sup> In contrast, the only

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**Table 1. OPCRIT analysis of King George III's mental health disorders in 1788–9, 1801 and 1810–11.**

Criteria	1788–9	1801	1810–11
DSM-III	Mania with psychosis	Mania with psychosis	Mania with psychosis
DSM-III-R	Manic episode with psychosis	Manic episode with psychosis	Hypomanic episode
DSM-IV	Manic episode with psychosis	Manic episode with psychosis	Hypomanic episode
Taylor and Abrams	Mania	Mania	Mania
ICD-10	Mania with psychosis	Mania with psychosis	Hypomania
RDC	Mania	Mania	Hypomania

Reproduced with permission.<sup>15</sup> DSM = Diagnostic and statistical manual of mental disorders; DSM-III = DSM, third edition; DSM-III-R = DSM, third edition, revised; DSM-IV = DSM, fourth edition; ICD = International and statistical classification of diseases and health-related problems, tenth edition; OPCRIT = Operational Criteria Checklist for Psychotic Illness; RDC = research diagnostic criteria.

mental disorder sometimes associated with acute porphyria, even in complete remission, is anxiety.<sup>13</sup>

In order to provide an objective diagnosis of the king's mental disorder, current techniques of cognitive archaeology<sup>14</sup> – including computer diagnostics<sup>15</sup> and handwriting analysis<sup>16</sup> – are currently being applied to the primary source data.

## Methods and results

Primary medical sources alone are the basis for our study, as secondary sources may be misleading and are best avoided in research of medical history. In addition, internationally accepted diagnostic criteria (*International and statistical classification of diseases and health-related problems*, tenth edition (ICD-10) and *Diagnostic and statistical manual of mental disorders*, fourth edition, text revision (DSM-IV-TR)) are used where possible.<sup>17,18</sup> Recently, computer-based diagnostic programs have become available, which should minimise any observer bias.

The computer diagnostic program Operational Criteria Checklist for Psychotic Illness (OPCRIT) was developed for case-note analysis of patients with psychotic illness participating in genetic studies and has been extended and validated in response to subsequent editions of the DSM criteria. Analysis with OPCRIT has confirmed the diagnosis of George III's mental illness as recurrent episodes of acute mania – bipolar disorder type I.<sup>19</sup> Table 1 shows the diagnostic conclusions for his episodes of acute mania based on different criteria using the OPCRIT method. No diagnosis is available for the episode in 1804, as insufficient clinical data are available in the medical records. The Willis papers do not record any clinical details of the king's illness, as the Willis brothers, physicians to George III, were excluded on the insistence of Prime Minister Henry Addington. The king was therefore under the care of Dr Samuel Foart Simons, physician to St Luke's asylum (1781–1811), but his medical notes apparently have not been preserved. This illustrates the value of using objective diagnostic methods in historical diagnosis.

The severity of George's mania during the 1810–11 episode was probably milder than during other episodes, as reflected by a diagnosis of hypomania rather than mania for three of the five diagnostic criteria. This probably reflects the onset of dementia discussed later in this paper. The severity of the mania can also be assessed objectively when detailed clinical information exists: for example, using the methods of Young *et al*,<sup>20</sup> a peak value of 40/60 is obtained for 23–28 December

1788, which corresponds to the most severe form of mania (Grade IV).

Handwriting deteriorates with age; signatures less so.<sup>21</sup> In particular, analysis of the spatial and lexical aspects of handwriting have been shown to correlate with a subject's score on the mini-mental state examination (MMSE).<sup>16</sup> This analytical method is used for medico-legal studies but, to date, has not been applied to distant historical figures. In a parallel study, therefore, computational linguistic analysis of changes in George III's handwriting and signatures in his letters<sup>22</sup> is being carried out, with preliminary results presented here. More than 500 of George III's letters, ranging from his earliest on 23 June 1749 (aged 11 years) up to 1 August 1809 (aged 70 years), have been collected and analysed. Fig 1 shows examples of letters before deterioration of the king's handwriting (1801) and after (1805); note the lexical and spatial deterioration of the 1805 letter and the increased size of the individual words in this later letter, which is a feature of impaired vision.<sup>16,21</sup>

Table 2 shows preliminary scores for representative letters. Up to the age of 50 years, George III had an essentially normal MMSE score. A transient decrease occurred during his major manic episode between August 1788 and May 1789, following which the scores basically return to premorbid levels. However, from about 1803, particularly from January 1805, there is progressive deterioration in the lexical and spatial scores. Unfortunately, George was blind from December 1805 and employed an amanuensis (Colonel Herbert Taylor), so only a single holograph letter from this later period has been located. The significant decrease in MMSE scores from 1804 and deterioration of signatures from 1808 (Fig 2) is consistent with the onset of dementia, which led to the appointment of the Prince Regent in 1811 and plagued King George up to his death in 1920. Current studies are extending these findings.

## Consequences of the claim of porphyria

As indicated earlier, widespread dissemination in 1966 of the claims of porphyria as the basis of George III's mental illness has had a plethora of literary, medical and other implications. The canonical parody 'Eight songs for a mad king' by Peter Maxwell Davis (1969) and Alan Bennett's play and film 'The madness of George III' (1991 and 1995, respectively) raised public interest in porphyria as a cause of the king's mental illness. These works, along with enthusiastic editorials in the *British Medical Journal* and elsewhere, further stimulated

(a) 23 April 1801

Apr 23 April 1801.<sup>39</sup>  
 The King is highly satisfied with the choice that  
 has been made of Mr. Gaslike to go as Charge  
 of Affairs to Petersburg; His Education in the  
 line of Foreign Affairs has been regular, he was  
 private secretary of Lord Rockingham at the Hague,  
 went to Denmark with the late most promising  
 Lord Seagraves, and followed him to Berlin  
 where he has retained much to the satisfaction  
 of that Court as well as of the various English  
 Ministers that have been employed there.

George III

(b) 2 August 1805

Weymouth Aug. 2<sup>nd</sup> 1805<sup>89</sup>  
 The King finding by Lord Howland's  
 letter of this Day that a Privy Council  
 must be held for the further Protraction  
 of the Parliament, names these 7 or 8<sup>th</sup>  
 as the ones equally agreeable to him for that  
 purpose

George III

Fig 1. George III's letters. (a) 23 April 1801 (MMSE score 21) and (b) 2 August 1805 (MMSE score 13). Reproduced with permission.<sup>23</sup> MMSE = mini-mental state examination.

Table 2. Fontana analysis and MMSE of a range of George III's letters between 22 September 1761 and 1 August 1809.<sup>16</sup>

Letter date	Age (years)	Fontana analysis			MMSE score
		Lexical score (Ex 5.0)	Spatial score (Ex 5.0)	Total score (Ex 10.0)	
22 September 1761	23	5.0	5.0	10.0	25
2 February 1768	30	4.5	5.0	9.5	23 <sup>a</sup>
29 April 1779	41	4.5	4.5	9.0	22 <sup>a</sup>
15 February 1784	45	4.5	4.5	9.0	22 <sup>a</sup>
18 November 1788	50	3.5	3.5	7.0	18 <sup>b</sup>
9 May 1789	51	4.0	4.0	8.0	20 <sup>a</sup>
10 May 1791	54	4.5	4.5	9.0	22 <sup>a</sup>
26 April 1800	61	4.5	4.0	8.5	21 <sup>a</sup>
1 April 1802	63	4.0	4.0	8.0	20 <sup>a</sup>
4 May 1803	64	3.5	3.0	6.5	17 <sup>b</sup>
18 August 1804	65	3.0	3.5	6.5	17 <sup>b</sup>
13 January 1805	66	3.0	3.5	6.5	17 <sup>b</sup>
21 June 1805	66	3.0	3.5	6.5	17 <sup>b</sup>
2 August 1805	66	2.5	2.0	4.5	13 <sup>b</sup>
21 November 1805	67	1.5	2.5	4.0	12 <sup>b</sup>
1 August 1809	71	1.0	1.0	2.0	8 <sup>c</sup>

MMSE score: 28–24 = normal; <sup>a</sup>23–20 = borderline dementia; <sup>b</sup>19–10 = moderate dementia; <sup>c</sup><10 = severe dementia.<sup>16</sup> MMSE = mini-mental state examination.



**Fig 2. Signatures of George III taken from his annual letters to his bankers, Messrs Drummonds (28 June 1801– 8 March 1810).** Reproduced with permission.<sup>24</sup>

subsequent claims by Macalpine and Hunter<sup>25</sup> and other speculators of mental illnesses that historical persons – ranging from William the Conqueror to the late Prince William of Gloucester and Princess Margaret<sup>26</sup> – suffered from underlying porphyrias. Similarly, historical novels have posited that Charles Darwin,<sup>27</sup> Vincent van Gogh and his siblings,<sup>28</sup> among others, were also affected by porphyrias.

More seriously, considerable effort has consequently been spent screening many thousands of patients with mental illness for porphyria. Saphier and Shaw<sup>29</sup> reported that some 15,000 patients in south-west London were screened for porphyria without a single case being identified. Surely the money involved could have been better used to improve patient care?

In view of the potentially questionable nature of Macalpine and Hunter's papers on the mental illnesses of George III and his ancestors and descendants, with their professional and personal claims underlying the nature and treatment of mental illnesses, should other publications by them be reconsidered?<sup>5</sup>

From the view of the professional historian, labelling of George III as porphyric has inadvertently diverted researchers from a study of the nature and causes of the various issues – both successful and unsuccessful – during his reign. With increasing evidence that patients with bipolar disorder in remission (euthymia) may exhibit behavioural and psychological changes, including low self-esteem, obsessive–compulsive features, neurocognitive impairment, excessive rumination and borderline personality disorders, these could have affected the political actions and judgement of George III and his descendants.<sup>30–35</sup> ■

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### Source

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