THE CORRESPONDENCE OF CHARLES DARWIN

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CALENDAR LIST OF LETTERS

The following list is in the order of the entries in the *Calendar of the correspondence of Charles Darwin*. It includes all those letters that are listed in the *Calendar* for the year 1879, and those that have been redated into 1879. Alongside the *Calendar* numbers are the corrected dates of each letter. A date or comment printed in italic type indicates that the letter has been omitted from this volume.

Letters acquired after the publication of the first edition of the *Calendar*, in 1985, have been given numbers corresponding to the chronological ordering of the original *Calendar* listing with the addition of an alphabetical marker. Many of these letters are summarised in a 'Supplement' to a new edition of the *Calendar* (Cambridge University Press, 1994). The markers 'f', 'g', and 'h' denote letters acquired after the second edition of the *Calendar* went to press in 1994.

8131. [1879]
8404. *11 July [1872]. To be published in the next supplement.*
8435. *26 July [1872]. To be published in the next supplement.*
8826. [before 27 Mar 1879]
9915. *6 Apr [1876 or later]. To be published in a future supplement.*
10341. [20 Jan 1879]
10342. [after 25 Feb 1879]
11033. 4 July [1879?]
11541. 3 June [1879]
11619. 20 July [1879]
11814. [1879?]
11815. [4 Feb – 8 Mar 1879]
11816. *Cancelled: not a letter.*
11817. 1 Jan 1879
11818. 2 Jan [1880]
11819. 3 Jan 1879
11820. 4 [June] 1879
11820a. 4 Jan [1879]
11821. 7 Jan 1879
11822. 8 Jan 1879
11823. 9 Jan 1879
11823f. 9 Jan 1879
11824. 10 Jan [1879]
11825. 10 Jan 1879
11825f. 11 Jan 1879
11826. 13 Jan 1879
11826f. 14 Jan 1879
11827. 13 Jan 1879
11828. 14 June [1879]
11829. 15 Jan 1879
11829f. 15 Jan 1879
11830. 16 Jan 1879
11831. 17 Jan 1879
11832. 17 Jan 1879
11833. [18 Jan 1879]
11834. 18 Jan 1879
11835. 19 Jan 1879
11836. 20 Jan 1879
11837. 20 Jan 1879
11838. 21 Jan 1879
11839. 21 Jan 1879
11840. 21 Jan 1879
11841. 23 Jan [1879?]
11842. 23 Jan 1879
11843. 23 Jan 1879
11843f. 23 and 30 Jan 1879
11844. 24 Jan 1879
11845. 25 Jan [1879]
11846. 25 Jan 1879
11847. 27 Jan 1879
11848. 26 Jan 1879

11849. 29 Jan 1879
11850. 29 Jan 1879
11851. 29 Jan 1879
11852. 31 Jan 1879
11853. Feb 1879
11854. [*c.* 12 Feb 1879]
11855. 1 Feb 1879
11856. 1 Feb 1879
11857. 3 Feb 1879
11858. 4 Feb 1879
11859. 5 Feb 1879
11860. 5 Feb 1879
11861. 6 Feb 1879
11862. 7 Feb 1879
11863. 7 Feb 1879
11864. 8 Feb 1879
11864a. 8 Feb 1879
11865. 9 Feb 1879
11866. 9 Feb 1879
11867. [after 9 Feb 1879]
11868. 10 Feb 1879
11869. 11 Feb 1879
11870. 11 Feb 1879
11871. 12 Feb 1879
11871f. 12 Feb 1879
11872. 12 Feb 1879
11873. 12 Feb 1879
11874. 12 Feb 1879
11874f. 12 Feb 1879
11875. 12 Feb 1879
11876. 12 Feb [1879]
11877. 12 Feb 1879
11878. 12 Feb 1879
11879. 12 Feb 1879
11880. 13 Feb 1879
11881. 13 Feb 1879
11882. 14 Feb 1879
11883. 14 Feb 1879
11883a. [before 25 Feb 1879]
11883f. [*c.* 25 Feb 1879]
11884. 16 Feb 1879
11885. 16 Feb 1879
11886. 17 Feb [1879]
11887. 17 Feb 1879
11887f. 17 Feb 1879
11888. 19 Feb 1879
11889. 20 Feb [1879]
11890. 20 Feb 1879
11891. [before 21 Feb 1879]
11892. 21 Feb [1879]
11893. 21 Feb 1879
11894. 21 Feb [1879]
11895. 21 Feb [1879]
11896. 21 Feb 1879
11896f. 25 Feb [1879]
11897. 21 Feb 1879
11898. 21 Feb 1879
11899. 21 Feb [1879]
11900. 24 Feb 1879
11901. 24 Feb 1879
11902. 25 Feb 1879
11903. 25 [Feb 1879]
11904. 25 Feb 1879
11904f. 26 Feb 1879
11905. 26 Feb 1879
11905f. 26 Feb [1879]
11906. 27 Feb 1879
11907. 27 Feb 1879
11908. 28 Feb [1879]
11909. 28 Feb 1879
11910. 28 Feb 1879
11911. [1 Mar 1879?]
11912. *3 Mar [1878]. To be published in the next supplement.*
11913. 3 Mar [1879]
11913f. 3 Mar [1879]
11914. 3 Mar 1879
11915. 4 Mar 1879
11915a. 4 and 6 Mar [1879]
11915b. 4 Mar 1879
11916. 5 Mar 1879
11917. 5 Mar 1879
11918. 8 Mar [1879]
11919. *Cancelled: part of 11918.*
11920. 9 Mar 1879
11921. 10 Mar [1879]
11922. 10 Mar 1879
11923. 11 Mar [1879]
11924. *Cancelled: same as 12308.*
11925. 12 Mar 1879
11926. 12 Mar 1879
11927. 12 Mar [1879]
11927a. 12 Mar [1879]
11928. 13 Mar 1879
11929. 13 Mar 1879
11930. 13 Mar 1879
11931. 13 Mar [1879]
11932. 14 Mar 1879
11933. *Cancelled: not a CD letter.*
11934. 14 Mar 1879
11935. 14 Mar 1879
11936. *15 Mar [1871]*
11937. 15 Mar 1879
11938. 13 Mar 1879
11939. 16 Mar [1879]
11940. 17 Mar 1879
11941. *Cancelled: see 11939 n. 4.*
11942. 17 Mar 1879

11943. 18 Mar 1879
11944. 19 Mar 1879
11945. [before 20 Mar 1879]
11946. 20 Mar 1879
11947. 22 Mar 1879
11948. 23 Mar 1879
11949. 24 Mar 1879
11950. 24 Mar 1879
11950f. 24 Mar 1879
11951. 25 Mar 1879
11952. 25 Mar 1879
11953. 25 Mar 1879
11954. 25 Mar 1879
11955. 26 Mar 1879
11955f. 26 Mar 1879
11956. 27 Mar 1879
11957. 27 Mar 1879
11958. 27 Mar 1879
11959. 28 Mar 1879
11960. 29 Mar 1879
11960f. 29 Mar 1879
11961. 30 Mar 1879
11962. 31 Mar 1879
11963. 31 Mar 1879
11963a. 31 Mar [1879]
11964. 1 Apr [1879]
11965. 1 Apr 1879
11966. 1 Apr 1879
11967. 2 [May] 1879
11968. 2 Apr 1879
11969. 2 Apr 1879
11970. 2 Apr [1879]
11971. 2 Apr 1879
11972. 2 Apr [1879]
11973. 3 Apr [1879]
11974. 3 Apr 1879
11975. 4 Apr 1879
11976. 4 Apr 1879
11977. 4 Apr 1879
11978. 5 [May] 1879
11978a. 5 Apr 1879
11978f. 6 Apr 1879
11979. 7 Apr 1879
11980. 7 Apr 1879
11981. 8 Apr 1879
11982. 8 Apr 1879
11983. 9 Apr 1879
11984. 9 Apr 1879
11985. 9 Apr 1879
11986. 10 Apr [1879]
11987. 18 Apr 1879
11988. 12 Apr [1879]
11989. 12 Apr 1879
11990. 12 Apr 1879
11991. 13 Apr [1879]
11992. 13 Apr 1879
11993. *Cancelled: same as 11992.*
11994. 14 Apr 1879
11995. 15 Apr [1879]
11995f. 15 Apr 1879
11996. 16 Apr [1879]
11997. 16 Apr 1879
11998. 17 Apr 1879
11999. 17 Apr 1879
12000. 17 Apr 1879
12001. 18 Apr 1879
12002. 18 Apr 1879
12003. 19 Apr 1879
12004. 19 Apr [1879]
12004a. 19 Apr 1879
12005. 21 Apr [1879]
12006. 21 Apr [1879]
12006f. 21 Apr 1879
12007. 22 Apr [1879]
12008. 22 Apr 1879
12009. 22 Apr [1879]
12010. 22 Apr 1879
12011. 25 Apr 1879
12012. *Cancelled: enclosure to 12017f.*
12013. *Cancelled: copy of 12011.*
12013f. *Cancelled: same as 12006f.*
12014. 26 Apr [1879]
12015. 28 Apr 1879
12016. 29 Apr 1879
12017. 29 Apr 1879
12017f. 29 Apr [1879]
12018. 30 Apr [1879]
12019. 30 Apr [1879]
12020. 30 Apr 1879
12021. *Cancelled: draft of 12027.*
12022. *To be published in a future supplement.*
12023. 1 May 1879
12024. 2 May 1879
12025. 2 May 1879
12026. [before 3 May 1879]
12027. 3 May 1879
12028. 3 May [1879]
12029. 3 May 1879
12030. [3 May 1879]
12031. 4 May 1879
12032. 5 May 1879
12033. 5 May [1879]
12034. 5 May 1879
12035. 7 May 1879
12036. 7 May [1879]
12037. 7 May 1879
12038. 8 May 1879
12039. 8 May 1879

12040. 8 May 1879
12041. 7 May 1879
12042. 9 May [1879]
12043. 9 May 1879
12044. 9 May 1879
12045. 9 May 1879
12046. 9 May 1879
12047. [13 May 1879]
12048. 10 May 1879
12049. [11 May 1879]
12050. 13 May 1879
12051. 13 May 1879
12052. 14 May 1879
12052a. 14 May 1879
12053. 15 May 1879
12054. 15 May [1879]
12055. 15 May 1879
12056. 16 May 1879
12057. 20 May 1879
12058. 21 May 1879
12059. 22 May 1879
12060. 23 May 1879
12061. 25 May [1879]
12062. 26 May [1879]
12063. 27 May 1879
12064. 27 May 1879
12065. 28 May [1879]
12066. 28 May 1879
12067. 29 May [1879]
12067f. 29 May 1879
12068. 29 May 1879
12069. 30 [May 1879]
12070. 30 May 1879
12071. 31 May 1879
12072. 31 May 1879
12073. 31 May [1879]
12074. 31 May 1879
12074a. 31 May 1879
12074b. [before 29 May 1879]
12075. [after 2 June 1879]
12076. [2 June 1879 or earlier]
12077. *30 July [1878]. To be published in the next supplement.*
12078. 2 June 1879
12078a. 2 June [1879]
12079. 3 June 1879
12080. 3 June [1879]
12081. 4 June 1879
12082. 4 June 1879
12083. 4 June 1879
12084. [before 5 June 1879]
12085. 5 June [1879]
12086. 5 June 1879
12087. 5 June 1879
12088. 5 June 1879
12089. 5 June 1879
12090. 6 June [1879]
12091. 6 and 7 June [1879]
12092. 7 June 1879
12093. 7 June 1879
12094. 7 June 1879
12095. 8 June [1879]
12096. 9 June [1879]
12097. 9 June 1879
12097f. 9 June 1879
12098. 10 June 1879
12099. 10 June 1879
12100. 10 June [1879]
12101. 10 June 1879
12102. [30 April 1879]
12103. 11 June 1879
12104. [after 11 June 1879]
12105. 13 June 1879
12106. 13 June 1879
12107. 15 June 1879
12108. 15 June 1879
12109. 15 [June 1879]
12110. 16 June 1879
12111. 16 June [1879]
12111f. [after 16 June 1879]
12111g. 16 June [1879]
12112. 17 June 1879
12113. 18 June 1879
12114. 18 June 1879
12115. 19 [June 1879]
12115f. 21 June 1879
12116. 24 June 1879
12117. 24 June [1879]
12117a. 24 June [1879]
12118. *Cancelled: part of 12384.*
12119. 25 June [1879]
12120. 25 June 1879
12121. [after 24 June 1879]
12122. 25 June [1879]
12123. 26 June [1879]
12124. [26 June 1879]
12124f. *Cancelled: not a CD letter.*
12125. 27 June [1879]
12126. 27 June 1879
12126f. [before 26 June 1879]
12127. 28 June [1879]
12128. 28 June [1879]
12128f. 30 June 1879
12129. [after 26] July [1879]
12130. 1 July 1879
12131. 1 July 1879
12131a. 1 July [1879]
12131f. *[22 June 1878]*

12132. 2 July [1879]
12133. 2 July [1879]
12134. 4 July 1879
12134a. 4 July [1879]
12135. 7 [July 1879]
12136. 7 July 1879
12137. 8 [July 1879]
12138. 8 July 1879
12139. 8 July 1879
12140. 9 July 1879
12141. 9 July [1879]
12142. 9 July 1879
12143. 10 July 1879
12144. 10 July 1879
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12146. 11 July 1879
12147. 11 July 1879
12148. 12 July 1879
12149. 12 July 1879
12150. 12 July [1879]
12151. 12 July 1879
12152. 12 July [1879]
12153. 12 July [1879]
12154. 13 July 1879
12155. 13 July 1879
12156. 14 July 1879
12157. 14 July 1879
12158. 14 July 1879
12159. 15 July 1879
12160. [before 12 July] 1879
12161. 15 July 1879
12162. 16 July 1879
12163. 17 July 1879
12164. 18 July [1879]
12165. 20 July 1879
12166. [*c.* 1 Aug 1879]
12167. 22 July [1879]
12168. 23 July 1879
12169. 23 July 1879
12170. 24 July 1879
12171. 25 July 1879
12172. 25 July 1879
12173. 26 July 1879
12174. 26 July 1879
12175. 27 July 1879
12176. 27 July 1879
12177. 29 July 1879
12177f. [before 31 July 1879]
12178. 2 Aug 1879
12179. [2 Aug 1879]
12180. 4 Aug 1879
12181. 4 Aug [1879]
12182. 5 Aug 1879
12183. 5 Aug [1879]
12184. 6 Aug 1879
12185. 7 Aug [1879]
12186. 7 Aug 1879
12186a. 7 Aug 1879
12187. 8 Aug 1879
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12203a. 28 Aug 1879
12204. 29 Aug 1879
12205. 30 Aug 1879
12206. [31 July 1879]
12207. [after 4 Nov 1879]
12208. 1 Sept 1879
12209. 1 Sept [1879]
12210. 1 Sept 1879
12211. 1 Sept 1879
12212. 2 Sept 1879
12213. 2 Sept 1879
12214. 2 Sept 1879
12214f. 2 Sept [1879]
12215. 3 Sept 1879
12216. 3 Sept [1879]
12217. 3 Sept [1879]
12218. 4 Sept 1879
12218f. [4 Sept 1879]
12219. 6 Sept 1879
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12220. 7 Sept 1879
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12222. 9 Sept 1879
12223. 10 Sept 1879
12224. 10 Sept [1879]
12225. 11 Sept 1879
12226. 11 Sept 1879
12227. 12 Sept 1879
12228. 13 Sept 1879
12229. 14 Sept [1879]
12230. 14 Sept 1879
12231. 15 Sept 1879
12232. 15 and 16 Sept 1879

12232f. 16 Sept 1879
12233. 18 Sept 1879
12234. 19 Sept 1879
12235. 19 Sept 1879
12236. 22 Sept [1879]
12236a. 24 Sept 1879
12237. 26 Sept 1879
12238. 26 Sept [1879]
12239. 30 Sept 1879
12240. [30 Nov 1879]
12241. 1 Oct [1879]
12242. 2 Oct 1879
12243. 2 Oct 1879
12244. 2 Oct [1879]
12245. 2 Oct 1879
12245a. 2 Oct 1879
12246. 3 Oct 1879
12247. 4 Oct [1879]
12248. 4 Oct 1879
12248f. [after 4 Oct 1879]
12249. 5 Oct 1879
12249f. 5 Oct [1879]
12250. 6 Oct 1879
12251. 7 Oct 1879
12251f. 8 Oct 1879
12252. 9 Oct 1879
12253. 12 Oct 1879
12254. 23 Oct 1879
12255. 13 Oct 1879
12256. 13 Oct 1879
12256a. 13 Oct 1879
12257. 14 Oct 1879
12258. 15 Oct 1879
12259. 16 Oct 1879
12260. 16 Oct 1879
12260a. 16 Oct 1879
12261. 17 Oct [1879]
12262. 18 Oct 1879
12263. 18 Oct 1879
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12268g. 23 Oct [1879]
12268h. 23 Oct 1879
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12272. 26 Oct 1879
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12275f. [29 Oct 1879]
12276. 29 Oct 1879
12277. 30 Oct 1879
12278. 30 Oct 1879
12279. 30 Oct 1879
12280. 31 Oct 1879
12281. 31 Oct 1879
12282. [before 26 Sept 1879]
12283. [11 Nov 1879]
12284. 1 Nov 1879
12285. *Cancelled: same as 12284.*
12286. 1 Nov 1879
12287. 2 Nov 1879
12288. 3 Nov 1879
12289. 4 Nov [1879]
12290. 4 Nov [1879]
12291. 4 Nov 1879
12292. 4 Nov 1879
12293. 4 Nov 1879
12294. 4 Nov 1879
12295. 6 Nov 1879
12296. 6 Nov 1879
12296f. [6 July 1879]
12297. 7 Nov 1879
12298. 7 Nov 1879
12299. 7 Nov 1879
12300. 8 Nov 1879
12301. 8 Nov [1879]
12301f. [9 Nov 1879]
12302. 9 Nov 1879
12303. 10 Nov 1879
12304. 10 Nov 1879
12305. 10 Nov 1879
12306. 10 Nov 1879
12307. 10 Nov 1879
12308. 11 Nov 1879
12309. 12 Nov [1879]
12310. 12 Nov 1879
12311. 12 Nov 1879
12312. 12 Nov 1879
12313. 12 Nov 1879
12314. 12 Nov 1879
12314f. 12 Nov [1879]
12315. [13 Nov 1879]
12316. 14 Nov 1879
12316f. 14 Nov [1879]
12317. 14 Nov [1879]
12318. 14 Nov 1879
12319. 14 Nov 1879
12320. 15 Nov 1879
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12326. 17 Nov 1879
12326f. 17 Nov 1879
12327. 18 Nov [1879]
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12335. 28 Nov 1879
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12338. 1 Dec [1879]
12339. 2 Dec 1879
12339a. 2 Dec 1879
12340. 4 Dec 1879
12341. 4 Dec 1879
12342. 4 Dec 1879
12343. 5 Dec 1879
12344. 5 Dec 1879
12345. 5 Dec 1879
12346. 8 Dec 1879
12346f. [8 Dec 1879]
12347. 9 Dec 1879
12348. 10 Dec 1879
12349. 10 Dec 1879
12350. 10 Dec 1879
12351. 11 Dec 1879
12352. 11 Dec [1879]
12353. 11 [Dec 1879]
12354. 12 Dec [1879]
12355. 13 Dec 1879
12356. 13 Dec 1879
12357. 16 Dec 1879
12358. 16 Dec 1879
12359. 16 Dec 1879
12360. 17 Dec 1879
12361. 17 Dec 1879
12362. 18 Dec 1879
12363. 19 Dec [1879]
12364. 19 Dec 1879
12365. 19 Dec 1879
12366. 20 Dec 1879
12367. 20 Dec 1879
12368. 20 Dec 1879
12368a. 22 Dec 1879
12368f. [after 20 Dec 1879]
12369. 23 Dec 1879
12370. 25 Dec 1879
12370f. 26 Dec 1879
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12375. 29 Dec 1879
12375f. 29 Dec 1879
12376. 29 Dec 1879
12376a. 29 Dec 1879
12377. 30 Dec [1879]
12378. 31 Dec 1879
12384. [28 June 1879]
12390. [after 4 Nov 1879]
12391. 15 Dec [1879]
12474. 13 Feb [1879]

INTRODUCTION

Darwin spent a considerable part of 1879 in the eighteenth century. His journey back in time started when he decided to publish a biographical account of his grandfather Erasmus Darwin to accompany a translation of an essay on Erasmus's evolutionary ideas by the German science writer Ernst Krause. Darwin's preoccupation with his own roots ran alongside a botanical interest in roots, as he and his son Francis carried out their latest experiments on plant movement for the book they intended to publish on the subject. They concentrated on radicles—the embryonic roots of seedlings—and determined that the impetus for movement derived from the sensitivity of the tips. Despite this breakthrough, when Darwin first mentioned the book to his publishers, he warned that it was 'dry as dust' (letter to R. F. Cooke, 9 September 1879). He was also unsatisfied with his account of Erasmus Darwin, declaring, 'My little biography has turned out, alas, very dull & has disappointed me much' (letter to Francis Galton, 15 [June 1879]). Even the prospect of a holiday in the Lake District in August did little to raise Darwin's spirits. 'I wish that my holiday were over & that I was safe at home again', he fretted, just days before his departure (letter to W. T. Thiselton-Dyer, [after 26] July [1879]). From July, Darwin had an additional worry: the engagement of his son Horace to Ida Farrer, stepdaughter of Darwin's niece Katherine Euphemia Farrer (Effie), was opposed by Ida's father. Above all, Darwin, despite his many blessings, was finding old age 'a dismal time' (letter to Henry Johnson, 24 September 1879). He may have been consoled to learn that his grandfather had felt the same way. In 1792, Erasmus Darwin had written: 'The worst thing I find now is this d—n'd old age, which creeps slily upon one, like moss upon a tree, and wrinkles one all over like a baked pear' (enclosure in letter from R. W. Dixon, 20 December 1879). The year ended with the start of one of the coldest winters on record. 'What has become of the Gulph Stream?' Anthony Rich inquired on 28 December, 'Has it lost itself, or gone some other way round?' At least the last letter of 1879 contained a warmer note and the promise of future happiness: Darwin learned he was to be visited by a person from his solicitor's office to complete Horace's marriage settlement (letter from W. M. Hacon, 31 December 1879).

Darwin's seventieth birthday on 12 February was a cause for international celebration. A telegram sent on the day from the Naples Zoological Station conveyed 'warmest congratulations to the veteran of Modern Zoology', but it was in Germany that Darwin was most fêted. A German bookkeeper and his wife sent birthday greetings and a photograph of their 2-year-old son named Darwin, who, they reported, had five instead of four 'cutting-teeth' in his upper 'chaw' but they

were 'as nice and good as could be' (letter from Karl Beger, [*c.* 12 February 1879]). The masters of Greiz College in Thuringia venerated Darwin as 'the deep thinker', while friends such as Ernst Haeckel, who had rebutted the physician Rudolf Virchow's attempt to discredit evolutionary theory in 1877, assured him that his views were now widely accepted in Germany. 'On this festive day', Haeckel told Darwin, 'you can look back, with justified pride and with the greatest satisfaction, on your life's work, which is crowned with glory' (letter from Ernst Haeckel, 9 February 1879). The botanist and schoolteacher Hermann Müller wrote on 12 February to wish Darwin a 'long and serene evening of life'. This letter crossed with one from Darwin, written on the same day, in which he expressed his distress at hearing that Müller had been treated shamefully by the German government. In order to attack the liberal minister of education, the Catholic political party in the German house of representatives had accused Müller of corrupting his students by reading them an extract from a materialist work by Carus Sterne containing the statement 'In the beginning was carbon' (letter from Hermann Müller, 14 February 1879).

Carus Sterne was the pseudonym of Ernst Krause, editor of the journal *Kosmos*, which had been founded in 1877 by Krause and others as a journal for presenting a uniform view of nature based on the theory of development in connection with Charles Darwin and Ernst Haeckel. *Kosmos* was, as Francis Darwin reported from Germany that summer, widely regarded as the 'organ of "uncultivated materialism"' (letter from Francis Darwin, [after 2 June 1879]). As one of Darwin's most ardent admirers, Krause not only sent birthday greetings but also produced an issue of *Kosmos* honouring Darwin. Among the essays was Krause's own tribute in the form of an account of the evolutionary work of Darwin's paternal grandfather, the philosopher and poet Erasmus Darwin.

This essay on Erasmus Darwin grabbed Darwin's attention and provided a welcome break from his work on movement in plants. Darwin clearly felt that his botanical project had become unwieldy. 'I am overwhelmed with my notes & almost too old to undertake the job which I have in Hand—ie movements of all kinds', he confessed to Thiselton-Dyer on 21 February, adding that the only thing worse was idleness. By early March, with encouragement from his brother, Erasmus Alvey Darwin, Darwin decided to publish an English translation of Krause's essay as a short book. Delighted by Darwin's proposal, Krause asked whether he could augment his essay, since the original had been written rapidly and without his having access to all the sources relating to Erasmus Darwin's life. Darwin, too, had started to consider adding a prologue, while his brother Erasmus proposed that George Darwin, Darwin's son and a keen genealogist, should add a note 'just to give the children correctly', mentioning in particular that Francis Galton was the son of one of Erasmus Darwin's daughters. 'It piles up the glory & would please Francis', he pointed out (letter from E. A. Darwin, 13 March [1879]). Meanwhile, Darwin began searching for a copy of Anna Seward's 1804 *Memoirs of the life of Dr. Darwin* to send to Krause, warning him that Robert Waring Darwin, Darwin's father, had stated 'that this life was not only grossly incorrect, but maliciously false'; Darwin also promised

to look for other materials relating to Erasmus Darwin, confessing, 'I am myself wholly & shamefully ignorant of my grandfathers life' (letter to Ernst Krause, 14 March 1879).

While searching for Seward's memoir for Krause, Darwin reread a library copy and decided to refute the 'wretched production' in a short preface to the translation, with a few particulars about the family and Robert Waring Darwin's remarks about Erasmus Darwin. 'I do not think you could work up these scanty materials in your account,' he told Krause on 19 March, 'because I must give them on my own authority.' Darwin was also keen to contradict false statements that had been published by Francis Galton's aunt, Mary Anne Schimmelpenninck. Erasmus had died in 1802, seven years before Darwin's birth, so his presence in his grandson's life consisted of his published works as well as a few anecdotes that Darwin's father used to recount. Despite the unflattering accounts of Erasmus's character that were published after his death, his botanic poems had remained in vogue during Darwin's early years. So much so, that when Darwin was suggested as a companion for Captain Robert FitzRoy on the *Beagle* voyage, Francis Beaufort of the Admiralty described the unknown young man as 'A M^{r} Darwin grandson of the well known philosopher and poet' (*Correspondence* vol. 1, letter from Francis Beaufort to Robert FitzRoy, 1 September [1831]). By the time Darwin came to investigate his grandfather's life in 1879, however, not only was Erasmus Darwin a largely forgotten figure, but he was also unknown in person to any of his living descendants, other than Darwin's sister Caroline (who was around 2 years old at the time of Erasmus's death). Darwin had to rely on remembered stories passed down different branches of the family to ascertain the events of Erasmus's life that best revealed his character. This work therefore led Darwin to establish or renew contact with his relatives as well as explore the genealogy of the Darwin family.

Darwin's wish to illustrate Erasmus Darwin's character using materials known only within his family often required a flurry of letters to relatives to untangle different versions of the same events. His cousin Violetta Darwin apologised for being of little help in this respect for she was according to herself a 'poor rememberer of stories', but made up for her lack by pointing out that her cousin Emma Nixon had 'the enviable talent of recollecting these things with the when & the where, & the who—' (letter from V. H. Darwin, 28 May [1879]). On the Galton side of the family, Elizabeth Anne Wheler, who was pleased that Darwin intended to 'undo Miss Seward & M^{rs}. Schimmelpenigs untrue remarks', sent passed-down family anecdotes and memories about Erasmus Darwin, whom her paternal grandparents thought 'perfect in every way' (letter from E. A. Wheler, 25 March 1879). She suggested that Darwin contact their cousin Reginald Darwin for materials relating to Erasmus Darwin. Reginald and Darwin had not met (nor, it seems, corresponded) since 1839, but because Darwin's name was so 'completely before the world', Reginald heard of him 'constantly, & always with pride' (letter from Reginald Darwin, 29 March 1879).

It was from Reginald that Darwin received the first significant document relating to their grandfather: his commonplace book. Here, Erasmus Darwin had recorded

his technological designs, his medical musings, and his views on topics such as atheism and prosperity. 'I have been deeply interested by the great book which you have so kindly lent me', Darwin wrote enthusiastically to Reginald Darwin on 4 April, declaring that reading it was like 'having communication with the dead'. The second important collection of manuscripts obtained by Darwin turned out to have been in his possession all along. 'I have made a strange discovery;' he told Reginald Darwin on 8 April, 'for an old box from my father marked 'Old Deeds,' and which consequently I had never opened, I found full of letters—hundreds from Dr. Erasmus'. This cache added to Darwin's admiration of his grandfather: 'The more I read of Dr. D. the higher he rises in my estimation.'

As his research deepened, Darwin became increasingly worried that his preface and Krause's revised essay might end up 'interfering with each other' (letter to Ernst Krause, 27 March 1879). Darwin's aim was 'to give some sort of picture of what the man was', he told Krause on 2 April. Nonetheless, the first part of Krause's revised essay, which arrived in early May, consisted almost entirely of a biographical account. The extent to which Krause had exceeded his brief was not fully apparent until June, when Darwin read the English translation of this section with dismay. If both accounts were published there would be 'two distinct biographies of the same man in one volume', Darwin pointed out to Krause on 5 June, adding that although Krause's biography 'was much the best', he was 'almost bound to publish' his own account, because so many of his relations had taken the trouble to help him. Krause immediately suggested that his biographical account be omitted and Darwin's published. He proposed instead to discuss the development of the idea of evolution prior to Erasmus Darwin, pointing out that Samuel Butler's recent book, *Evolution, old and new*, which he thought 'an immeasurably superficial and inaccurate piece of work,' made such an introduction 'almost indispensable' (letter from Ernst Krause, 7 June 1879). Darwin welcomed Krause's suggestion, but warned him on 9 June not to 'expend much powder & shot on M^r^ Butler', for he really was not worth it; his work was 'merely ephemeral'. Darwin (no doubt recalling Butler's attack on evolution and particularly the theory of natural selection in 1877) had previously told Krause, 'He is a very clever man, knows nothing about science & turns everything into ridicule. He hates scientific men' (letter to Ernst Krause, 14 May 1879).

From the start of his research on Erasmus Darwin, Darwin had been adamant that he would be guided by the 'one golden rule for Biographers', that is, not to insert anything that would interest only members of the family; what was published must be 'in some degree interesting to the public' (letter to Reginald Darwin, 10 April [1879]). However, even members of Darwin's own family found his first draft lacked interest. Henrietta Litchfield thought it 'very dull,—almost too dull to publish', while Leonard Darwin considered that insufficient attention had been paid to arrangement, and that Henrietta should be given the task of cutting up the text and rearranging it—a job, he was sure, she could do 'very tastefully and well, and with little fatigue' (letter to G. H. Darwin, 12 July 1879, and letter from Leonard Darwin, [before 12 July] 1879). Emma Darwin also thought the text needed cutting,

but Erasmus Alvey Darwin liked it, leaving Darwin 'more perplexed than ever about life of Dr. D' (letter to Francis Darwin, 12 July [1879]). It was little consolation that George Darwin wrote on 13 July to say that he disagreed with Henrietta, or that Krause had written on 10 July to say that he had derived great pleasure from Darwin's account and hoped that nothing would be cut. By this point, Darwin had already decided that writing the biography was 'abominable work': he did not know what to believe or what was worth telling, and he regretted going beyond his 'tether' (letter to W. T. Thiselton-Dyer, 5 June 1879, and letter to G. H. Darwin, 12 July 1879). Darwin's final task was to bring Krause into line. With his own biographical notice 'greatly condensed & altered in arrangement', Darwin apologetically but firmly told Krause on 13 August that a large part of his article would have to be omitted, issuing, in the politest terms, the ultimatum that he would 'give up publishing' if Krause objected.

Although Darwin had worked on his grandfather's biography at times when he was unable to carry out botanical research (first during his stay in Southampton with Sara and William Darwin in May and then while on holiday in the Lake District in August), he vowed never again to be tempted out of his 'proper work' (letter to James Paget, 14 July 1879). At this time, his proper work was the botanical study of movement in plants. Over the previous two years, he and his son Francis had worked together on the experimental investigation of the causes and effects of this movement, and they intended to publish their results as a book. By June 1879, Darwin was completing an 'excessively difficult' chapter on plants that slept (especially those in families whose leaves closed at night), and continuing research into the sensitivity of the tips of radicles, the embryonic roots of seedlings (letter to Francis Darwin, 16 June [1879]).

As he had done in 1878, Francis Darwin spent the summer of 1879 working in Julius Sachs's state-of-the-art physiological botany laboratory in Würzburg, also intending to continue experiments on the sensitivity of radicles. Francis experienced obstacles from the start, as he reported in a letter of 29 May. Sachs had changed his views on heliotropism to such an extent that he implied that Francis's experiments were 'hardly worth doing'; he also disputed that the potash that appeared in drops of water left on leaves was a secretion, arguing instead that it came from a specific gland in the leaf. This struck Francis as 'bosh', but, he complained to Darwin: 'I don't know how to disprove it.' Francis was increasingly intolerant of Sachs's autocratic manner towards other botanists in the laboratory and also grumbled about having to sit through a long dinner at which 'no one could get up and go because Sachs didn't.' Moreover, Sachs admired Francis's little spectroscope so much that Francis had to order one for him. Even the laboratory was a cause of irritation. Francis found that he was unable to trace the nutation of a growing shoot on glass because the floor of the laboratory shook too much for good observations: 'the growing tip is quite jogged away from the micrometer scale.' Then he had the 'horrid bother' of changing lodgings when he discovered that he had rooms in a house that was 'disreputable' (letter from Francis Darwin, [after 16 June 1879]).

Darwin, however, continued to focus on the scientific benefits of Francis's being in Sachs's laboratory, in terms of both learning experimental techniques and discovering the views of the other botanists. He was glad to know that Ernst Stahl and Albert Bernhard Frank did not think that plants were 'mere machines', reminding Francis on 2 June that he had long thought that movements in both plants and animals were similar, especially the localisation of sensitivity and the transmission of an influence from an excited part. As Darwin investigated different ways to determine whether the tips of radicles were the locus of root sensitivity, discovering that treating them with caustic was more effective than using bits of card, he found he was 'getting to hate the work' (letter to Francis Darwin, 25 June [1879]. Although anxious that Francis should not do experiments in Würzburg that could be done at Down, Darwin did encourage him to test the possibility that the sensitivity of radicles might not be confined to the tip alone. He suggested increasingly sophisticated techniques to deter responses to stimulus, from slicing off or cauterising the tips to wrapping those of aerial roots in the prepared outer membrane of ox intestine known as gold-beater's skin (letter to Francis Darwin, 25 June [1879]).

This research directly challenged the views of Sachs, who not only denied that sensitivity was located in the apex of the radicle but also claimed that the use of caustic was inappropriate because it would release nitric acid, which would be 'diffused back into the root & injure it!!!!' (letter from Francis Darwin, [before 26 June 1879]). Aware of Sachs's prestige, Darwin told Francis on 28 June that he would rather convert Sachs 'than any other half-dozen-Botanists put together', but he was not surprised by Sachs's objections. The previous year, Darwin had followed the findings of Theophil Ciesielski on the sensitivity of the apex of radicles; work which Sachs had criticised on methodological grounds. Darwin's disagreement with Sachs also revolved around issues of experimental protocol: Darwin thought that Sachs had sliced off the tips of radicles incorrectly when replicating Ciesielski's experiments. 'Great man as Sachs is, I am not even staggered by him', Darwin confidently wrote to Francis on 28 June. Darwin's confidence was not misplaced. It was Sachs who 'appeared rather staggered' when Francis showed him some 'caustic beans' that were part of an experiment devised to demonstrate that the tips of radicles were sensitive (letter from Francis Darwin to Emma Darwin, 30 June 1879). It was this experiment that left Darwin with 'no shade of doubt' that the apex of the radicle was 'a kind of brain for certain movements' (second letter to Francis Darwin, 2 July [1879]).

Sachs guarded his reputation not only on personal grounds but also for institutional reasons. His laboratory was regarded as the premier institute for physiological botany, and any challenge to his methods had the potential to threaten his research enterprise. The doctoral and post-doctoral students were assigned topics by Sachs, who also dictated experimental method and design. Many resented his heavy-handed control but, unlike Francis Darwin, had to keep on good terms with him. 'I see it is a very good thing to be as independent of him as possible',

Francis told Darwin on 4 July, after reporting that he had carried out some successful experiments 'quite against Sach's advice'. Francis was not sure whether this act of rebellion would affect an earlier invitation he had received to contribute an essay on his 'root work' to Sachs's journal, *Arbeiten des botanischen Instituts in Würzburg*. He had accepted the invitation because he wished to publish with the other people working in the laboratory and for the 'honour and glory', but had been instructed not to refer to statements published by Sachs that were contradicted by his experimental results. Moreover, after learning that Sachs would translate the paper, he told Darwin that it was usually called purgatory at the institute when a manuscript had been given to Sachs but not yet approved (letter from Francis Darwin, [before 31 July 1879]). Francis evidently survived the ordeal as his paper was published by Sachs in 1880.

Before leaving Germany, Francis visited the botanist Anton de Bary in Strasbourg, and made some purchases of instruments in Heidelberg. After a hint from his father, Francis also purchased a gift for his son Bernard (nearly 3 years old and variously called Abbadubba or Ubba), who had remained at Down. 'I was talking yesterday with Ubba about your return', Darwin wrote to Francis on 4 July. 'He said "it is likely he will bring me some soldiers"— so a word to the wise.' Over the summer, Darwin had sent regular updates about Bernard's progress with all the pride of a fond grandfather. On 3 June, he wrote, 'Bernard has been very charming: today he has been gabbling all the words he knows into a confused mess together, as quick as he could gabble them.' Within a month, Bernard had reached an altogether more advanced stage. 'Herbert Spencer says in his new book 'Data of Ethics', that the ever present idea of causation is the highest point in the evolution of mind, & I am sure that Abbad. has reached the highest point, for his "why"—"what for" &c are incessant', Darwin joked on 2 July (first letter). Much of the time, however, Bernard remained absorbed in his own world. 'Abbadubba is more charming than ever,' Darwin wrote on 16 June, 'but his soul is so full of drums, trumpets & soldiers that he has no time to look at me or say a word to me'.

In August, Bernard accompanied his grandparents, Aunt Elizabeth (Bessy) Darwin, and Henrietta and Richard Litchfield to the Lake District for a holiday in a hotel owned by Victor Marshall, a Darwin family friend. Francis was to join them on his return from Germany and wondered 'how the dickens to get to Coniston' (letter from Francis Darwin, [before 31 July 1879]). Darwin advised travelling by train, although it took eight hours, assuring Francis that they were 'all in good heart' for their 'tremendous journey' (letter to Francis Darwin, [2 August 1879]). The journey proved more arduous than expected. Nonetheless, Darwin endured a three-hour delay better than Emma Darwin, and Bernard proved to be a 'capital traveller … neither cross nor ennuied' (Emma Darwin to W. E. Darwin, [4 August 1879] (DAR 219.1: 125)). Darwin found the inn '*very* comfortable', but told Leonard Darwin on 12 August that there were 'too many human beings' for his taste. He also admired the scenery, took several excursions, and thought Marshall's garden 'paradise' (letter to Victor Marshall, 25 August 1879). Anthony Rich had written on 27 July to suggest that the Darwins might visit the hamlet of Troutbeck, which was 'out of the line

of ordinary tourists'. He also hoped that the 'Clerk of the weather' might keep the Darwins in his 'holy keeping'. This was not to be. For most of the holiday the weather was atrocious.

The other cloud on the horizon was Thomas Henry Farrer's objection to the engagement between his daughter Ida and Horace Darwin. This was all the more surprising because Darwin and Farrer had corresponded on scientific topics since 1868 and after Farrer's second marriage to Darwin's niece in 1873 the Darwins had stayed at the Farrers' home, Abinger Hall, on several occasions. Horace had first approached Farrer to request Ida's hand in marriage in late June, only to be rebuffed. Farrer's objection was based on his impression of Horace's poor health and lack of profession, and he insisted that all contact between Horace and Ida must cease. Emma Darwin persuaded her husband to meet Farrer. 'This proved most useful', Emma reported, because Darwin told Farrer 'a great deal about Horace that he did not know, especially about his peculiar turn for mechanical invention, which is his profession tho' not a profitable one; also Dr C[lark]'s opinion that he was so likely to get well as life goes on, & that it was suppressed gout. Also how well off he wd be, w. is a matter of some consequence when you are not likely to make money' (Emma Darwin to Sara Darwin, [1 July 1879] (DAR 219.1: 123)). Darwin wrote to Farrer on 27 June to request ten minutes conversation with him, but although the meeting was amicable, Farrer did not relent. While the Darwins were in Coniston, Horace was instructed to wait for three months. 'Nothing can be more useless than T.H's conduct', Emma Darwin pointed out. 'He has no intention of stopping the marriage; but I believe he knows that all his family (Farrer & Erskines) will disapprove so utterly of it, some on worldly grounds & some on religious, that he wishes to be able to say that he has opposed it' (letter from Emma Darwin to W. E. Darwin, [4 August 1879] (DAR 219.1: 125)). Nothing more could be done by the Darwins at this stage but to wait. In addition to this concern, Darwin was even denied his usual relief returning from holiday. Instead of a welcome end to enforced idleness, his homecoming was marred by the apparent loss of a box containing, among other things, Krause's manuscript account of Erasmus Darwin. This left Darwin miserable until the box was recovered. In contrast, Bernard was delighted to get home '& began drumming at once' (Emma Darwin to H. E. Litchfield, [27 August 1879] (DAR 219.9: 201)).

Darwin's celebrity was never far from the surface even among friends. After Darwin had left Coniston, Marshall regretted not having asked him to plant a tree in the garden and requested him to send a young plant as a memorial of his visit. 'With respect to the tree, you treat me as a Royal Duke', Darwin responded on 14 September, saying that he would send an acorn from one of the 'children' of a cork-tree grown from an acorn sown by his father on the day of his birth. However, when the acorns failed to ripen, Darwin had to ask Joseph Hooker to come to his rescue by sending Marshall a specimen of either the northern red oak or the scarlet oak: 'to be planted in my honour!' (letter to J. D. Hooker, 4 November [1879]). While in Coniston, Darwin was invited to meet the local celebrity, John Ruskin. Marshall

wrote on 7 September that Ruskin, the day after the Darwins arrived in Coniston, had remarked to someone, 'if Mr Darwin would get different kinds of air & bottle them, & examine them when bottled, he would do much more useful work than he does in the contemplation of the hinder parts of monkeys.' This greatly amused Darwin, who felt it was 'very acute of Mr Ruskin to know that I feel a deep & tender interest about the brightly coloured hinder half of certain monkeys' (letter to Victor Marshall, 14 September 1879). Ruskin's opinion of Darwin's work appears not to have come up when the Darwins lunched with him on 12 August (Darwin's 'Journal'). Nor did Darwin mention it when he told George Romanes on 14 September that he had seen Ruskin several times '& he was uncommonly pleasant.'

Over the year Darwin received various honours in the form of diplomas and fellowships from scientific institutions around the world. At the end of the year he was awarded a prize of 12,000 francs by the Turin Academy of Sciences for his works on physiological botany (letter from Michele Lessona, 28 December 1879). Closer to home, on 9 May he was astonished to hear that he was to be awarded the Baly Medal from the Royal College of Physicians for distinguished work in the science of physiology. 'I hope to be able to attend on June 26th to receive the medal,' Darwin replied a few days later, 'but my health is very doubtful & I may not be equal to the exertion' (letter to H. A. Pitman, [13 May 1879]). In the end, he did attend, with Emma Darwin insisting that they combine this trip with a few days' rest in London. This, Darwin thought, would be 'very tedious with nothing on earth to do' (letter to Francis Darwin, 24 June [1879]). Darwin probably found having to sit for a portrait commissioned by the Cambridge Philosophical Society equally tedious. He was portrayed in his red doctor's gown, to commemorate the honorary doctorate of laws he had received from Cambridge University in 1877. Emma Darwin recorded that Darwin found the sittings tiring, and that she was 'a good deal disgusted' with the gown because it dominated the picture (letter from Emma Darwin to H. E. Litchfield, [17 July 1879] (DAR 219.9: 199)).

Samuel Wilks, who delivered the Harveian oration immediately before Darwin received the Baly Medal, wrote to Darwin on 26 July saying that Darwin's presence at the oration made it one of the most memorable days of his life. Wilks declared himself to be a 'devoted disciple'. Other correspondents, many of whom were not scientific investigators, also claimed to be devotees, and plied Darwin with information, suggestions, and questions. On 5 February, a stonemason, Thomas Maston, wrote to say that he had purchased *Origin* and *Descent* two years ago: 'I have read them, and studied them the most of this time, and strugled, in my humble way, to defend the theory tharein enunciated, against that un-holy cant, which as been risen against it by a certain class of desprate theological thinkers in the hope of provoking ignorant laughter, to shame honest men into silence on this subject, chosing in this way to show their weakness, and to exibite the truth strength of your conclousions.' He concluded by saying he could not afford *Expression* and hoped Darwin would send him a copy.

Religion was less easily dismissed by other letter writers. 'I remain doubting between your theory and the ecclasiastical dogma', Mary Jung, a young Austrian

woman, wrote on 7 January. 'When my reason agrees with your opinion, my heart stands to the latter and so I am in a continnual conflict with myself.' 'Permit me to advise you to try not to be troubled about the differences between ecclesiastics & scientific men', Darwin wrote in reply on 11 January. 'Search for the truth, & then your conscience will be at ease. In the course of time ecclesiastics have always managed to make their conclusions somehow to harmonise with ascertained truths, which they at first vehemently & ignorantly opposed'. On 2 April, Nicolai Mengden, the 17-year-old son of a German nobleman, wrote, 'I make bold to ask you whether a god can exist for a true believer in your theory, or whether one must choose between your theory and a belief in God, and whether those who believe in your theory can and must also believe in God?' He continued, 'I have resolved to act in accordance with your advice, in order to follow what you tell me absolutely.' Evidently hoping to curtail the correspondence, Emma Darwin replied on 8 April stating that Darwin was too busy to answer all letters: 'He considers that the theory of evolution is quite compatible with the belief in a God, but that you must remember that different persons have different definitions of what they mean by God—.' Undaunted, Mengden wrote again on 3 June to ask Darwin, 'what definition of God do you deem appropriate for a follower of your theory?' Moreover, should Darwin wish to 'completely overwhelm' Mengen with kindness, could he tell Mengen what to make of the idea of life after death, and whether one might hope for a reunion? The question had urgency for Mengen as he had just experienced the death of his best friend. In a succinct reply (justified on the grounds that he was 'much engaged, and old man, & out of health'), Darwin informed Mengen, 'Science has nothing to do with Christ, except in so far as the habit of scientific research makes a man cautious in admitting evidence. For myself, I do not believe that there ever has been any Revelation. As for a future life every man must judge for himself between conflicting vague probabilities' (letter to Nicolai Mengden, 5 June 1879).

On the very day that Emma sent the first reply to Mengden, Darwin had complained to his cousin Reginald, 'half the fools throughout Europe write to ask me the stupidest questions' (letter to Reginald Darwin, 8 April 1879). However, religion was not dismissed lightly by Darwin, even if he remained reticent about discussing it. After hearing about a claim that his work revealed him to be an atheist, Darwin told the clergyman John Fordyce on 7 May, 'It seems to me absurd to doubt that a man may be an ardent Theist & an evolutionist', pointing to Charles Kingsley and Asa Gray as proof of this. 'What my own views may be is a question of no consequence to any one except myself', he told Fordyce, 'But as you ask, I may state that my judgment often fluctuates. Moreover whether a man deserves to be called a theist depends on the definition of the term: which is much too large a subject for a note. In my most extreme fluctuations I have never been an atheist in the sense of denying the existence of a God.— I think that generally (& more and more so as I grow older) but not always, that an agnostic would be the most correct description of my state of mind.'

Darwin always weighed up whether it was worth defending his views from attacks that were not made on scientific grounds. Evidently concerned about the

nature of Malcolm Guthrie's critique of Herbert Spencer's views of the theory of natural selection, Darwin circulated the book within his family. He also heard from John Fletcher Moulton, who, after some faint praise, condemned Guthrie's work as 'a pseudo-scientific criticism of a pseudo-scientific work', admitting, 'I always find myself roused by any attempt to supplant our only true means of acquiring knowledge—observation & experiment' (letter from J. F. Moulton, 10 December 1879). In reply to Darwin's response that if Spencer had done nothing for science, it was a pity that his talents and labour had been 'thrown away', Moulton pointed out in a long letter of 13 December that although Spencer was not a scientific discoverer, and his physical writings were 'pernicious' and undeserving of 'kindly treatment', he would be recognised as a great educator or 'preacher'. Spencer, Moulton reminded Darwin, was one of the earliest to accept evolution, 'long before there could be any scientific knowledge of the modus operandi of the process': 'he represented vividly and plausibly how this great principle might account for all that we see around us.' Moulton classed Spencer as one of those writers who made people 'rapidly appreciate the force of new ideas that would otherwise have only slowly made themselves felt'. This, Moulton believed, was work that 'true scientific discoverers' always refused to do because it required 'a kind of intellectual laxity to enable a man to thus outrun our knowledge'. Spencer provided inspiration not guidance; he would be remembered 'as one of the prophets and not as one of the founders of the new era'.

Throughout the year, scientific scholars and acquaintances benefited from Darwin's generosity, especially if they were furthering the cause of evolutionary thought or working for the public good. Darwin promoted Fritz Müller's discoveries in Brazil by enabling the republication in the *Proceedings of the Entomological Society of London* of an essay by Müller on sexual dimorphism and a view of mimicry (later known as Müllerian mimicry) that Darwin said was quite new to him (letter to Raphael Meldola, 6 June [1879]). In addition, after receiving Müller's description and photograph of a new species of frog that bore its eggs on its back and lived on the leaves of bromeliads, Darwin arranged for Müller's letter and the image of the frog be published in *Nature* (letter to J. N. Lockyer, 4 and 6 March [1879]). When Darwin's staunch German defender Ernst Haeckel was in England, he was invited to stay overnight at Down House. Darwin greatly admired the recent translation of Haeckel's work *Freedom in science and teaching*, and Haeckel anticipated the 'greatest joy' in talking to Darwin about 'Darwinism in Germany' (letter from Ernst Haeckel, 30 August 1879). However, the pleasure was not so great for the Darwin family. Emma Darwin found Haeckel very pleasant, but, 'Oh—such shouting', she wrote to William Darwin: 'He has been coasting round the N. of Scotland & I suppose shouting against the winds & waves, & has not been able to let down his voice'. In her view, Haeckel was like a 'great good-natured boy', who uttered everything 'exactly like the German in Punch without the slightest attempt to pronounce rightly' and talked 'most devoutly' about the way German men of science quarrelled (letter from Emma Darwin to W. E. Darwin, [6 September 1879] (DAR 219.1: 126)).

Darwin's commitment to certain individuals and projects occasionally extended from encouragement to financial support. When Grant Allen, a full-time journalist,

suffered a breakdown due to overwork and illness, Darwin was quick to contribute to a fund to send him and his family to the Riviera for the summer (letter to G. J. Romanes, 23 July 1879). Allen, who regarded Darwin with 'all the respect which every Evolutionist owes to the founder of his faith', had defended Darwin's theory of sexual selection in his recent book on colour sense, which greatly pleased Darwin (letter from Grant Allen, 12 February 1879). One of Allen's targets was Alfred Russel Wallace, Darwin's strongest critic on the subject of sexual selection, whose explanation of phenomena like the display of the peacock Darwin had long thought to be 'mere empty words' (letter to Grant Allen, [before 21 February 1879]). Darwin confessed, 'For many years I have quite doubted his scientific judgment, though admiring greatly his ingenuity & originality', but this did not deter him from considering whether to petition government for a pension for Wallace, whose employment prospects were precarious. Darwin contacted Joseph Hooker on 17 December to ask his opinion: 'I am in very bad position for doing much, but should feel bound to undertake all the labour, if the plan is considered feasible by you & a few others.' Hooker immediately poured cold water on the scheme. 'I greatly doubt its advisability', he cautioned Darwin on 18 December, pointing out that it would look very bad for men of science to be seen to be supporting a pension for a spiritualist. Although Darwin successfully campaigned for a pension for Wallace the following year, he was convinced by Hooker in December 1879, and grateful for having been saved from a 'mistake & mess' (letter to J. D. Hooker, 19 December [1879]). The German palaeontologist Leopold Würtenberger fared better. When he wrote on 10 January to ask whether Darwin could find him a job in a British geological establishment so he could continue his study of the developmental laws of ammonites, he probably little suspected that Darwin, knowing that the prospect of a job or grant was hopeless, would offer him the financial means 'to work for about a year on science' (letter to Melchior Neumayr, 24 January 1879). 'It is impossible to put into words how deeply overcome with gratitude I am towards the great master who is supporting my work in such an outstanding way', Würtenberger wrote on 7 February, after receiving £100 from Darwin.

Frederick King, who believed that Darwin's views could help to place 'the practice of Agriculture upon Scientific principles' and prevent 'Cattle diseases, Potato diseases &c', probably did not know that Darwin had already invested in such a project (letter from Frederick King, 27 February 1879). The Belfast businessman James Torbitt, who wished to carry out experiments to cultivate blight-resistant potatoes based on Darwin's study of self- and cross-fertilisation, had first contacted Darwin in 1876. By 1878, Darwin was sufficiently impressed by Torbitt's dedication and experimental method to help him petition for public aid to continue his research. However, when a government grant was not forthcoming, Darwin had stepped in with funds of his own. Torbitt sent an account of the experiments enabled by these funds and some specimens to Darwin on 30 April 1879, telling him that he was 'pushing the principle of selection much further' and expressing the hope that trials might be carried out at the Royal Botanic Gardens at Kew. 'It would be of no use to send the

potatoes to Kew, for they have so many subjects to attend to they will not undertake anything fresh of such a nature', Darwin wrote in reply on 3 May, but told Torbitt, 'I have today planted & labelled the two varieties & will hereafter report the result to you.' As well as trialling Torbitt's potatoes, Darwin participated in Francis Burges Goodacre's programme of crossing Chinese and common geese, keeping the birds in the grounds of Down House. Darwin believed that the fertility of these hybrids showed that mutual sterility was not an immutable criterion for defining species. By August, however, Darwin was eager to return the geese to Goodacre, telling him that any remaining birds would be eaten by the household. The geese were troublesome to keep and, Darwin explained to Goodacre on 29 August, 'the gander pursues and frightens a little grandchild who lives with us.'

By late October, Darwin was again thinking of trying to obtain government funds for Torbitt. On 18 September, he had heard that Torbitt had continued his experiments despite his declining business and the 'great sorrow and anxiety' caused by his wife's illness and breast amputation. The reason Darwin may not have acted immediately after hearing about Torbitt's troubles was that his contact at the Board of Trade was Thomas Farrer, who remained steadfast in his wish that the engagement between his daughter Ida and Darwin's son Horace be kept secret and that there should be no contact between them. It was not until mid-October that Farrer was forced to recognise that the attachment between the couple was 'strong and real' and so, despite continuing to harbour misgivings about Horace's health and career, finally agreed to their engagement being made public (letter from T. H. Farrer, 12 October 1879). Darwin's response not only expressed joy but also attempted to heal rifts. He understood Farrer's concerns about Horace's health and acknowledged that the match was not brilliant in a worldly point of view, but pointed out, 'Horace has as sweet a temper & as unselfish a disposition as anyone whom I have ever known; & this is of more importance for the happiness of married life than wealth, grandeur or distinction, & more even than strong health' (letter to T. H. Farrer, 13 October 1879).

Darwin's correspondence with Farrer for the remainder of the year alternated between negotiations regarding the marriage settlement and possible funding for Torbitt's potatoes. While the decisions concerning the amount of money to be settled on Horace and Ida came to an amicable end, those concerning Torbitt began to flounder. 'What a pity there cannot be 2 sets of men in our Government,' Darwin wrote to Farrer in exasperation on 23 October, 'one to do all the miserable squabbling & the other to attend to the real interests of the country.' On 1 November, Darwin told Torbitt that he had emphasised to Farrer that abandoning the potato trials would be 'a National misfortune'. Although Farrer was willing to help and passed information to Lord Sandon, minister for the Board of Trade, Darwin was not hopeful. 'I trust that you may be able to continue your admirable potato work, even if you do not receive Government aid', he wrote to Torbitt on 27 December, before reporting, 'I have heard nothing: I know that Mr. Farrer has had two communications with Ld. Sandon on the subject; I heard from two officials

that he is one of those men who cannot make up their minds what to do. It is enough to sicken one to see how politicians waste their time in squabbling and neglect doing any good.'

As the year's end approached, Darwin was heartened by the wider reaction to his biography of Erasmus Darwin. Despite his misgivings about the work, and the unexpectedly low sales of the book, the response from readers was gratifying. Francis Galton read the book with the greatest pleasure, finding it 'a marvel of condensation' and the biography 'quite a new order of writing, so scientifically accurate in its treatment' (letter from Francis Galton, 12 November 1879). The comment that perhaps most pleased Darwin came from the surgeon James Paget, who, in a letter of 18 November 1879, declared that the biography was 'an unmatched illustration of the transmission of intellectual tendency as well as intellectual strength', which he hoped would be 'continued through yet many generations!' Although Darwin had spent much of 1879 investigating his ancestors and looking into the past, he never lost sight of the future. When, earlier in the year, he decided to increase Francis Darwin's salary as his assistant, he mentioned that Henry Woodward, a palaeontologist at the British Museum, had stated with reference to Francis: 'I hope you are still able to enjoy & share in work going on & to feel (as we all do) that you live again in your son.' 'This,' Darwin told Francis, 'pleased me much' (letter to Francis Darwin, 21 February [1879]).

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Copyright statement

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Zentralbibliothek Zürich, Zurich, Switzerland

A NOTE ON EDITORIAL POLICY

The first and chief objective of this edition is to provide complete and authoritative texts of Darwin's correspondence. For every letter to or from Darwin, the text that is available to the editors is always given in full. The editors have occasionally included letters that are not to or from Darwin if they are relevant to the published correspondence. Volumes of the *Correspondence* are published in chronological order. Occasional supplements will be published containing letters that have come to light or have been redated since the relevant volumes of the *Correspondence* appeared. Letters that can only be given a wide date range, in some instances spanning several decades, are printed in the supplement following the volume containing letters at the end of their date range. The first such supplement was in volume 7 and included letters from 1828 to 1857; the second was in volume 13, and included letters from 1822 to 1864; the third was in volume 18, and included letters from 1835 to 1869; the fourth was in volume 24, and included letters from 1838 to 1875.

Dating of letters and identification of correspondents

In so far as it is possible, the letters have been dated, arranged in chronological order, and the recipients or senders identified. Darwin seldom wrote the full date on his letters and, unless the addressee was well known to him, usually wrote only 'Dear Sir' or 'Dear Madam'. After the adoption of adhesive postage stamps in the 1840s, the separate covers that came into use with them were usually not preserved, and thus the dates and the names of many recipients of Darwin's letters have had to be derived from other evidence. The notes made by Francis Darwin on letters sent to him for his editions of his father's correspondence have been helpful, as have matching letters in the correspondence, but many dates and recipients have had to be deduced from the subject-matter or references in the letters themselves.

Transcription policy

Whenever possible, transcriptions have been made from manuscripts. If the manuscript was inaccessible but a photocopy or other facsimile version was available, that version has been used as the source. In many cases, the editors have had recourse to Francis Darwin's large collection of copies of letters, compiled in the 1880s. Other copies, published letters, or drafts have been transcribed when they provided texts that were otherwise unavailable.

The method of transcription employed in this edition is adapted from that described by Fredson Bowers in 'Transcription of manuscripts: the record of variants', *Studies in Bibliography* 29 (1976): 212–64. This system is based on accepted principles of modern textual editing and has been widely adopted in literary editions.

The case for using the principles and techniques of this form of textual editing for historical and non-literary documents, both in manuscript and print, has been forcefully argued by G. Thomas Tanselle in 'The editing of historical documents', *Studies in Bibliography* 31 (1978): 1–56. The editors of the *Correspondence* followed Dr Tanselle in his conclusion that a 'scholarly edition of letters or journals should not contain a text which has editorially been corrected, made consistent, or otherwise smoothed out' (p. 48), but they have not wholly subscribed to the statement made earlier in the article that: 'In the case of notebooks, diaries, letters and the like, whatever state they are in constitutes their finished form, and the question of whether the writer "intended" something else is irrelevant' (p. 47). The editors have preserved the spelling, punctuation, and grammar of the original, but they have found it impossible to set aside entirely the question of authorial intent. One obvious reason is that in reading Darwin's writing, there must necessarily be reliance upon both context and intent. Even when Darwin's general intent is clear, there are cases in which alternative readings are, or may be, possible, and therefore the transcription decided upon must to some extent be conjectural. Where the editors are uncertain of their transcription, the doubtful text has been enclosed in italic square brackets.

A major editorial decision was to adopt the so-called 'clear-text' method of transcription, which so far as possible keeps the text free of brackets recording deletions, insertions, and other alterations in the places at which they occur. Darwin's changes are, however, recorded in the back matter of the volume, under 'Manuscript alterations and comments', in notes keyed to the printed text by paragraph and line number. All lines above the first paragraph of the letter (that is, date, address, or salutation) are referred to as paragraph '0'. Separate paragraph numbers are used for subscriptions and postscripts. This practice enables the reader who wishes to do so to reconstruct the manuscript versions of Darwin's autograph letters, while furnishing printed versions that are uninterrupted by editorial interpolations. The Manuscript alterations and comments record all alterations made by Darwin in his letters and any editorial amendments made in transcription, and also where part of a letter has been written by an amanuensis; they do not record alterations made by amanuenses. No attempt has been made to record systematically all alterations to the text of copies of Darwin letters included in the correspondence, but ambiguous passages in copies are noted. The editors believe it would be impracticable to attempt to go further without reliable information about the texts of the original versions of the letters concerned. Letters to Darwin have been transcribed without recording any of the writers' alterations unless they reflect significant changes in substance or impede the sense; in such cases footnotes bring them to the reader's attention.

Misspellings have been preserved, even when it is clear that they were unintentional: for instance, 'lawer' for 'lawyer'. Such errors often indicate excitement

or haste and may exhibit, over a series of letters, a habit of carelessness in writing to a particular correspondent or about a particular subject.

Capital letters have also been transcribed as they occur except in certain cases, such as 'm', 'k', and 'c', which are frequently written somewhat larger than others as initial letters of words. In these cases an attempt has been made to follow the normal practice of the writers.

In some instances that are not misspellings in a strict sense, editorial corrections have been made. In his early manuscripts and letters Darwin consistently wrote 'bl' so that it looks like 'lb' as in 'albe' for 'able', 'talbe' for 'table'. Because the form of the letters is so consistent in different words, the editors consider that this is most unlikely to be a misspelling but must be explained simply as a peculiarity of Darwin's handwriting. Consequently, the affected words have been transcribed as normally spelled and no record of any alteration is given in the textual apparatus. Elsewhere, though, there are misformed letters that the editors have recorded because they do, or could, affect the meaning of the word in which they appear. The main example is the occasional inadvertent crossing of 'l'. When the editors are satisfied that the intended letter was 'l' and not 't', as, for example, in 'stippers' or 'istand', then 'l' has been transcribed, but the actual form of the word in the manuscript has been given in the Manuscript alterations and comments.

If the only source for a letter is a copy, the editors have frequently retained corrections made to the text when it is clear that they were based upon comparison with the original. Francis Darwin's corrections of misreadings by copyists have usually been followed; corrections to the text that appear to be editorial alterations have not been retained.

Editorial interpolations in the text are in square brackets. Italic square brackets enclose conjectured readings and descriptions of illegible passages. To avoid confusion, in the few instances in which Darwin himself used square brackets, they have been altered by the editors to parentheses with the change recorded in the Manuscript alterations and comments. In letters to Darwin, square brackets have been changed to parentheses silently.

Material that is irrecoverable because the manuscript has been torn or damaged is indicated by angle brackets; any text supplied within them is obviously the responsibility of the editors. Occasionally, the editors are able to supply missing sections of text by using ultraviolet light (where text has been lost owing to damp) or by reference to transcripts or photocopies of manuscript material made before the damage occurred.

Words and passages that have been underlined for emphasis are printed in italics in accordance with conventional practice. Where the author of a letter has indicated greater emphasis by underlining a word or passage two or more times, the text is printed in bold type.

Paragraphs are often not clearly indicated in the letters. Darwin and others sometimes marked a change of subject by leaving a somewhat larger space than usual between sentences; sometimes Darwin employed a longer dash. In these

cases, and when the subject is clearly changed in very long stretches of text, a new paragraph has been started by the editors without comment. The beginnings of letters, valedictions, and postscripts are also treated as new paragraphs regardless of whether they appear as new paragraphs in the manuscript. Special manuscript devices delimiting sections or paragraphs, for example, blank spaces left between sections of text and lines drawn across the page, are treated as normal paragraph indicators and are not specially marked or recorded unless their omission leaves the text unclear.

Occasionally punctuation marking the end of a clause or sentence is not present in the manuscript; in such cases, the editors have inserted an extra space following the sentence or clause to set it off from the following text.

Additions to a letter that run over into the margins, or are continued at its head or foot, are transcribed at the point in the text at which the editors believe they were intended to be read. The placement of such an addition is only recorded in a footnote if it seems to the editors to have some significance or if the position at which it should be transcribed is unclear. Enclosures are transcribed following the letter.

The hand-drawn illustrations and diagrams that occur in some letters are reproduced as faithfully as possible and are usually positioned as they were in the original text. In some cases, however, it has been necessary to reduce the size of a diagram or enhance an outline for clarity; any such alterations are recorded in footnotes. The location of diagrams within a letter is sometimes changed for typesetting reasons. Tables have been reproduced as close to the original format as possible, given typesetting constraints.

Some Darwin letters and a few letters to Darwin are known only from entries in the catalogues of book and manuscript dealers or mentions in other published sources. Whatever information these sources provide about the content of such letters has been reproduced without substantial change. Any errors detected are included in footnotes.

Format of published letters

The format in which the transcriptions are printed in the *Correspondence* is as follows:

1. *Order of letters*. The letters are arranged in chronological sequence. A letter that can be dated only approximately is placed at the earliest date on which the editors believe it could have been written. The basis of a date supplied by the editors is given in a footnote unless it is derived from a postmark, watermark, or endorsement that is recorded in the physical description of the letter (see section 4, below). Letters with the same date, or with a range of dates commencing with that date, are printed in the alphabetical order of their senders or recipients unless their contents dictate a clear alternative order. Letters dated only to a year or a range of years precede letters that are dated to a particular month or range of months, and these, in turn, precede those that are dated to a particular day or range of dates commencing with a particular day.

2. *Headline*. This gives the name of the sender or recipient of the letter and its date. The date is given in a standard form, but those elements not taken directly from the letter text are supplied in square brackets. The name of the sender or recipient is enclosed in square brackets only where the editors regard the attribution as doubtful.

3. *The letter text*. The transcribed text follows as closely as possible the layout of the source, although no attempt is made to produce a type-facsimile of the manuscript: word-spacing and line-division in the running text are not adhered to. Similarly, the typography of printed sources is not replicated. Dates and addresses given by authors are transcribed as they appear, except that if both the date and the address are at the head of the letter they are always printed on separate lines with the address first, regardless of the manuscript order. If no address is given on a letter by Darwin, the editors have supplied one, when able to do so, in square brackets at the head of the letter. Similarly, if Darwin was writing from an address different from the one given on the letter, his actual location is given in square brackets. Addresses on printed stationery are transcribed in italics. Addresses, dates, and valedictions have been run into single lines to save space, but the positions of line-breaks in the original are marked by vertical bars.

4. *Physical description*. All letters are complete and in the hand of the sender unless otherwise indicated. If a letter was written by an amanuensis, or exists only as a draft or a copy, or is incomplete, or is in some other way unusual, then the editors provide the information needed to complete the description. Postmarks, endorsements, and watermarks are recorded only when they are evidence for the date or address of the letter.

5. *Source*. The final line provides the provenance of the text. Some sources are given in abbreviated form (for example, DAR 140: 18) but are listed in full in the List of provenances unless the source is a published work. Letters in private collections are also indicated. References to published works are given in author–date or short-title form, with full titles and publication details supplied in the Bibliography at the end of the volume.

6. *Darwin's annotations*. Darwin frequently made notes in the margins of the letters he received, scored significant passages, and crossed through details that were of no further interest to him. These annotations are transcribed or described following the letter text. They are keyed to the letter text by paragraph and line numbers. Most notes are short, but occasionally they run from a paragraph to several pages, and sometimes they are written on separate sheets appended to the letter. Extended notes relating to a letter are transcribed whenever practicable following the annotations as 'CD notes'.

Quotations from Darwin manuscripts in footnotes and elsewhere, and the text of his annotations and notes on letters, are transcribed in 'descriptive' style. In this method the alterations in the text are recorded in brackets at the places where they occur. For example:

'See Daubeny ['vol. 1' *del*] for *descriptions of volcanoes in [*interl*] S.A.' *ink*

means that Darwin originally wrote in ink 'See Daubeny vol. 1 for S.A.' and then

deleted 'vol. 1' and inserted 'descriptions of volcanoes in' after 'for'. The asterisk before 'descriptions' marks the beginning of the interlined phrase, which ends at the bracket. The asterisk is used when the alteration applies to more than the immediately preceding word. The final text can be read simply by skipping the material in brackets. Descriptive style is also used in the Manuscript alterations and comments.

Editorial matter

Each volume is self-contained, having its own index, bibliography, and biographical register. A chronology of Darwin's activities covering the period of each volume and translations of foreign-language letters are supplied, and additional appendixes give supplementary material where appropriate to assist the understanding of the correspondence. A cumulative index is planned once the edition is complete. References are supplied for all persons, publications, and subjects mentioned, even though some repetition of material in earlier volumes is involved.

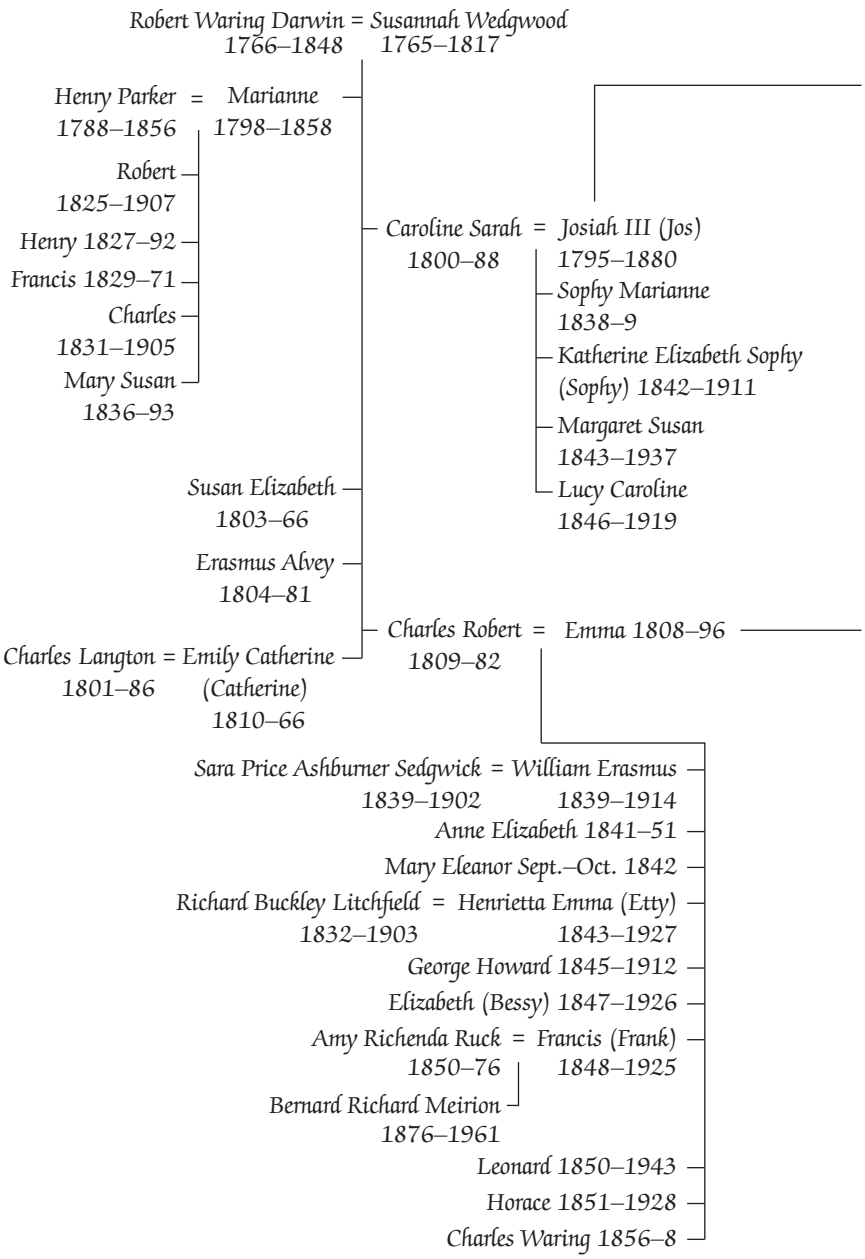
If the name of a person mentioned in a letter is incomplete or incorrectly spelled, the full, correct form is given in a footnote. Brief biographies of persons mentioned in the letters, and dates of each correspondent's letters to and from Darwin in the current volume, are given in the Biographical register and index to correspondents. Where a personal name serves as a company name, it is listed according to the family name but retains its original order: for example, 'E. Schweizerbart'sche Verlagsbuchhandlung' is listed under 'S', not 'E'.

Short titles are used for references to Darwin's books and articles and to collections of his letters (e.g., *Descent*, 'Parallel roads of Glen Roy', *LL*). They are also used for some standard reference works and for works with no identifiable author (e.g., *Alum. Cantab.*, *Wellesley index*, *DNB*). For all other works, author–date references are used. References to the Bible are to the authorised King James version unless otherwise stated. Words not in *Chambers dictionary* are usually defined in the footnotes with a source supplied. The full titles and publication details of all books and papers referred to are given in the Bibliography. References to archival material, for instance that in the Darwin Archive at Cambridge University Library, are not necessarily exhaustive.

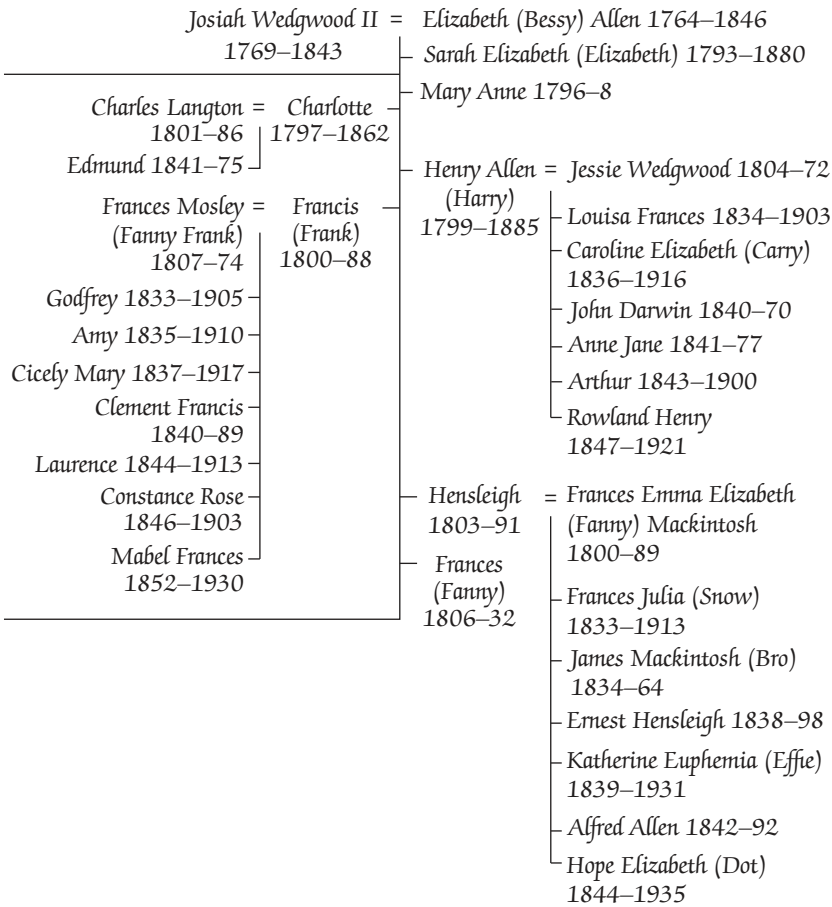
Darwin and his correspondents writing in English consistently used the term 'fertilisation' for the processes that are now distinguished as fertilisation (the fusion of female and male gametes) and pollination (the transfer of pollen from anther to stigma); the first usage known to the editors of a distinct term for pollination in English was in 1873 (letter from A. W. Bennett, 12 July 1873 (*Calendar* no. 8976)). 'Fertilisation' in Darwin's letters and publications often, but not always, can be regarded as referring to what is now termed pollination. In the footnotes, the editors, where possible, have used the modern terms where these can assist in explaining the details of experimental work. When Darwin or his correspondents are quoted directly, their original usage is never altered.

The editors use the abbreviation 'CD' for Charles Darwin throughout the footnotes. A list of all abbreviations used by the editors in this volume is given on p. xlvi.

The Wedgwood and Darwin



Families up to 1879



ABBREVIATIONS

AL	autograph letter
ALS	autograph letter signed
DS	document signed
LS	letter in hand of amanuensis, signed by sender
LS(A)	letter in hand of amanuensis with additions by sender
Mem	memorandum
pc	postcard
(S)	signed with sender's name by amanuensis
TLS	typed letter signed

CD	Charles Darwin
CUL	Cambridge University Library
DAR	Darwin Archive, Cambridge University Library
del	deleted
illeg	illegible
interl	interlined
underl	underlined

TRANSCRIPTION CONVENTIONS

[some text]	'some text' is an editorial insertion
*[*some text*]*	'some text' is the conjectured reading of an ambiguous word or passage
[some text]	'some text' is a description of a word or passage that cannot be transcribed, e.g., '*3 words illeg*'
〈 〉	word(s) destroyed
〈some text〉	'some text' is a suggested reading for a destroyed word or passage
〈*some text*〉	'some text' is a description of a destroyed word or passage, e.g., '*3 lines excised*'