

Editorial

This issue contains two papers which fall into our evolutionary category.

The first on the scarlet tiger moth (*Panaxia dominula*) is of considerable interest since the authors (Clarke *et al.*) have fortuitously discovered Philip Sheppard's original notes on the founding of the "Railway Bank Colony" on the Wirral Way – the colony on which they have been working since 1989 (see *The Linnean* 6(2):1; 9(1):2-3).

This experimental colony had apparently been established in 1961 by Sheppard with the objective of measuring over a number of generations the frequency of the *medionigra* allele and he accordingly recorded the phenotypes observed for the years 1962–67, 76. When all the data for the colony 1961–1995 are compared it is clear that although there are fluctuations between years (cf. 1976) – there is no evidence that the *medionigra* gene leads to a disadvantage of the heterozygote and that the three genotypes were exactly in the Hardy-Weinberg proportions of 9:6:1.

The second paper is on the inheritance of intelligence in a Pembrokeshire family with an inbreeding coefficient close to that of the English squirearchy. Darwin was ambivalent in his attitude to inbreeding (there being 4 first-cousin marriages between Darwins and Wedgwoods in his generation) and believed that in general first-cousin offspring suffered in life's struggle but that such unions could be condoned among gentlefolk brought up in richly different environments.

Society News

The week-long meeting on bamboos attracted experts from all over the world to discuss this (taxonomically) little-understood plant group. Amongst the erudite presentations, which included a lecture sponsored by the *Annals of Botany* and given by Professor Lynn G. Clarke of Iowa State University on the evolution of bamboos *Bamboos, Centrepiece of the Grass Family*, the delegates were set the task of identifying the species from which the Society's Meeting Room pointer was derived. Dr. Mikio Kobayashi, of Utsunomiya University, Japan, noting that the upper and lower sections are from different species, subsequently identified them to the satisfaction of other delegates. Appropriately, the upper (thinner) cane is *Pseudosasa japonica*, whilst the lower part is *Phyllostachys aurea*.

The Society has changed its computer system. The first system, consisting of two free-standing machines, was introduced in 1984. The cost was £8400, mainly for hardware. In 1991, a five-machine network was introduced, costing £27000. But by this time the old machines were costing £5600 a year to service, so that at the end of five years the net cost was around half the purchase price. The cost of the new system is £14300 and there are the usual bells and whistles (it even talks) calculated to reduce even the most equanimous to gibbering wrecks.

One casualty of the transfer is the e-mail system. This was based on a provider called Demon. The old system was slow and the product rather basic in format, so we decided to give Demon the heave-ho. Hang on, they said, we have a new, very wonderful piece of software called Turnpike. Give it a try, they urged. Well, it took

a computer expert a day and a half to install it on the Executive Secretary's machine (a decision taken, he would add, in his absence) and it is clear that, whatever Turnpike is, it is not user-friendly. Or perhaps it takes a long time to get to know. Since the original idea was to offer e-mail *inter alia* as a service to members who used the Society's rooms, it seems that we really must kiss Demon goodbye. It will be a lingering parting – we are part way through our annual subscription – but we hope that Members will note that we are now *linsoc@AOL.com*.

Theodore O'Grady, who occupied the position of the Executive Secretary from 1951 to 1979, died in April. An appreciation is being prepared for a later issue of *The Linnean*. Meantime, the Society extends its sympathy to Mrs. O'Grady and other members of his family.

Dr. John McArthur, Fellow *Honoris causa*, died on 26th April aged 94. He was the inventor of the microscope which bears his name. He was made Fellow *Honoris causa* in 1995, but ill-health did not permit him to attend the ceremony of admission to the Society. A full obituary appeared in *The Times* on 8th May.

The pattern of Sixth Form lectures will change in 1996/97. The costs of getting to six separate evening lectures are, for those schools outside London, now a considerable sum at a time when school finances are struggling. The programme in 1996/97 will have only two evening lectures, on 17th October on plant development with Dr. Shirley Coomber and 7th November – *Is Human Evolution Over?* – with Professor Steve Jones FLS. There will be two Saturday morning symposia (which have always been well-attended) on 23rd November on *Origins* and on 15th March 1997 on *Health, History and Disease*. Fellows are welcome to attend Sixth Form Lectures, but should check with the office that there is room – one recent school symposium attracted 204 people to the Meeting Room!

The Society is hosting a Mason Conference on 12th September 1996 at the BAAS Meeting in Birmingham. The title of the meeting is *Genetic Conservation* and an impressive set of speakers has very kindly agreed to participate: Prof. Bryan Clarke FLS, FRS (University of Nottingham: *Saving Snails and Saving Genes*), Dr. Jim Mallet (UCL: *Conservation Genetics in British Butterflies*), Dr. Gordon Reid FLS (Chester Zoo: *Saving Species Through Zoo Conservation Breeding Programmes*), Mr. Andrew Sheppy FLS (Cobthorn Trust: *Saving the Bacon, and the Pig*), Mr. Roger Smith (Wakehurst Place: *Seed Banks and the Conservation of Flowering Plant Diversity*), and Mr. Dick Vane-Wright FLS (NHM: *Wholesale Conservation of Genetic Diversity*). Booking for the conference, which is free to members of the Linnean Society, should be made through the office – all that is required is a name.

Picture Quiz

The January Quiz (11 (4): 4) featured Nathaniel Wallich (1786–1854) who made an immense contribution to the systematic knowledge of India's flora.

Born at Copenhagen on the 28th January 1786 his father, Lazarus Wallich Wulff, a wealthy Jewish merchant, sent him at the age of 15 to study under the botanist Martin Vahl at the nearby university from where in 1806 he qualified as a Licentiate of the

Royal Academy of Surgeons. The following year (1807) Nathaniel Wallich went out to the Danish East India Company's settlement at Serampore as the resident doctor.

Serampore is 14 miles up river from Calcutta where the Honourable (= English) East India Company had both a settlement and a Botanic Garden. Immediately upon his arrival in Bengal Wallich became acquainted with Dr. William Roxburgh (1751–1815) who was then Superintendent of the H.E.I.C.'s Calcutta Botanic Garden (from 1793–1813). Meanwhile as a sequel to the Napoleonic Wars back in Europe and the outbreak of hostilities between Britain and Denmark the H.E.I.C. captured the settlement of Serampore in 1808 and Wallich was taken prisoner-of-war. However he was soon released and not only went to live with William Roxburgh but was also appointed to assist him (but without additional allowances).

Later (1812) Wallich temporarily returned to his post at Serampore, then after a brief holiday in Mauritius (for health reasons) joined the H.E.I.C.'s Bengal army as assistant surgeon (1814). The irony of the situation was compounded on his further appointment by the H.E.I.C. in 1814 as Acting Superintendent of the Calcutta Botanic Garden and finally Superintendent 1817–1846.

The Calcutta Botanic Garden soon came to be known as 'Wallich's pet' and during the 1820's was the great pleasure ground of Calcutta. Furthermore Wallich continued the tradition of employing teams of Indian artists to paint and draw the new specimens pouring into the herbarium. He also took these artists with him into the field on his various journeys. It has been calculated that upwards of 15,000 drawings were executed under Wallich's direction.

As Superintendent of the most famous, privately owned botanic garden, with staff of more than 300, and collectors connected with it stationed over much of India, Nepal, Penang, Kumaon etc., Wallich had a budget unsurpassed by any other scientific establishment, certainly in the then British Empire! Furthermore the provision for travelling expenses was said to be 'on the most liberal scale'. His brief, however, included the investigation of the East India Company's vast and rapidly increasing dominions (with its right to acquire territory etc. granted by Cromwell). Thus during the first 10 years of his incumbency Wallich performed five extensive journeys; he visited Khatmandu and spent a year in Nepal (1820–21) sending plants back to Banks, Lambert, Roscoe as well as to our founder James Edward Smith, then after a long illness for which he went on a sea voyage to Penang and Singapore (where he also made extensive collections) he visited the River Ganges and the frontiers of Garwhal and Nepal in 1825 to report on submontane forests.

In 1826–27 he accompanied an E.I.C. Government mission to the Court of Ava, visited the mountains in the neighbourhood of that city and proceeded to the newly-acquired Burmese territory on the costs of Martaban and Tenasserim making extensive botanical collections and reporting to the H.E.I.C. on the forest resources (part of this area is now Mandalay).

On his return from Burma Wallich was again plagued by ill-health and this time he requested permission to repair to England and to take all his collections with him so that he might deliver them in person to the Court of Directors of the Honourable East India Company or in reality deposit them in the Museum at East India House in

Leadenhall Street, London. Permission was granted by the Company who also paid for their removal from Calcutta to Leadenhall Street.

This collection of Wallich's included material sent to him from all over 'British India' and the Far East by a multitude of collectors ranging from Raffles and Jack (Penang; Sumatra) to Hardwick (N.W. India) and Moorcroft (W. Himalaya) and comprised more than 8,000 specimens including duplicates.

For the next four years of his furlough Wallich applied himself assiduously to the completion of his *magnus opus*, the *Plantae Asiaticae Rariores*, 3 vols. 1829–1832, and the distribution of the duplicates of his enormous collections to the principal public and private museums in Europe and America. In his Linnean Obituary this last act was said to have constituted the most valuable contribution of its kind ever made to botanists, and was in itself a sufficient monument of one man's devotion to science. Meanwhile he drew up a numerical list of all the dried specimens of plants in his collection (which by December 1829 had reached 2,153) in order to be able to recognise and distribute the duplicates both to museums and to the botanists who had agreed to work on specific groups (Bentham, Brown, the de Candolles, Graham, Greville, Haworth, Hooker, Lindley, Prescott).

Just before his leave drew to a close in 1832, he arranged that the top set of the catalogued specimens containing a complete series of all the species, was to be presented by the Court of Directors of the East India Company to the Linnean Society. This gift was accepted on our behalf by the President, Lord Stanley on 23 June 1832. Coincidentally the house from which Wallich worked in London was 61 Frith Street, less than 50 yards across Soho Square from the Linnean Society's rooms which were at that time in Bank's old house. Though actually moving the collections cost us nothing the Society had to raise almost £390 to pay for its housing while the East India Company gave us a further £200 towards the cost of the mounting paper.

Upon his return to Calcutta in 1832, Wallich soon discovered that the hitherto wealthy East India Company was facing economic difficulties. These were compounded in 1833 when the Government, realising that the monopoly of the East India Company actually impeded trade in tea and aggravated the restrictive effects of high duties, passed an act abolishing the monopoly (tea sales went from: 32,057,852 lbs. in 1833 to 44,360,550 lbs. in 1835).

The Board of Directors of the East India Company, anticipating this act, established a Tea Committee under Lord William Bentinck, the Governor-General to investigate the possibility of growing tea in India. As a consequence of a circular sent out to all East India Company officials asking for information on *Camellia sinensis*, Captain Charlton reported he had seen tea growing wild in Assam in 1834. Moreover he sent back fruiting material as well as leaves to Francis Jenkins the Tea Committee's agent in Gauhati who passed it on to Wallich. The Tea Committee recommended that a delegation, with Wallich in charge, be sent to the newly conquered province of Assam to study the tea plant *in situ*. In August 1835 Wallich (aged 49) set out from Calcutta together with William Griffith (another E.I.C. employee) and Dr. John McClelland a geologist and surgeon for Assam.

Their discovery of the tea plant is documented in Griffith's diary edited after his

death by McClelland and published in 1847:

1836 Jan. 16th. This day we gave up to the examination of the tea in its native place. It occurs in a deep jungle to the south of the village, and at a distance of about three miles from it. Our route thither lay through first a rather extensive grass jungle, then through a deep jungle.... We were fortunate enough to find it both in flower and fruit, owing to its site; its growth is tall and slender, and its crown, at least that of the smaller, very small and ill-developed. Large trees are rare; in fact, they have been all cut down by the Singphos, who are like all other natives excessively improvident. The largest we saw, and which Wallich felled, was, including the crown, 43 feet in length. Small plants are very common, although Bruce has already removed 30,000. Mac. thinks they grow chiefly on the margins of the ravinules or hollows. Their leaves were all large, of a very dark green, and varying from four to eight inches in length.

Having found what they came for the delegation broke up at Jorhat in March 1836, with Wallich, whose health was rapidly deteriorating, returning to Calcutta while Griffith went on to explore eastern Assam and Upper Burma not returning to Calcutta till May 1838.

Wallich suggested to Jenkins (the Governor-General's agent) that the tea tracts should be taken over by purchase or lease, fenced in and brought under cultivation. However when McClelland's Report on the Physical Condition of the Assam Tea Plant was published in 1839 favouring Assam for the indigenous variety, Wallich changed his mind and advocated areas such as Dehra Dun and Kangra for the cultivation of China tea!

In the space of the next five years (1836–1840) Wallich and his staff distributed 189,932 Indian plants to nearly 2,000 public and private gardens all over the world (see Report to Government of Bengal 1840). But, Wallich's health deteriorated (he probably had malaria) and on this occasion he went to the Cape of Good Hope where he remained for exactly two years (1842–43), collecting and transmitting plants to his many friends back in England.

Once more he returned to Calcutta but his health was such that he was finally compelled to quit and he returned home to England in 1847. During the remaining half dozen years of his life he took an active part in Linnean meetings and with the election of Robert Brown to the Presidency he became one of his vice-Presidents (1849). He died on 28th April 1854 and like Brown is buried in Kensal Green Cemetery albeit in the dissenter's section.

He was an elegant scholar, a classical writer, and an accomplished European and Oriental linguist. He also possessed a great knowledge of the habits, economic and medicinal properties and uses of plants. His obituary further notes that he was a man of warm affection, of ready wit, a most amusing companion and indefatigable in his exertions for the advancement of his favourite science. He became a Fellow in 1818.

Postscript

When Wallich left his collections to the Society he requested that we send a good set of specimens to the Calcutta Botanic Gardens, which he had inadvertently left off the list of intended recipients. The Society apparently did not accede to Wallich's request. However, much later, with the demise of the East India Company in 1858,



Clue: A pillar of the East India Company.

Evolution: At the mind's cinema
 I turn the handle and the story starts:
 Reel after reel is all astronomy,
 Till life, enkindled in a niche of sky,
 Leaps on the stage to play a million parts.

Life leaves the slime and through all ocean darts:
 She conquers earth, and raises wings to fly;
 Then spirit blooms, and learns how not to die; —
 Nesting beyond the grave in others' hearts.

— I turn the handle: other men like me
 Have made the film: and now I sit and look
 In quiet, privileged like Divinity
 To read the roaring world as in a book.
 If this thy past, where shall thy future climb,
 O Spirit, built of Elements and Time!

Who wrote this poem and when and where was it written? In which College did the poet hold his/her professorship at the time of writing?

the residuum of Wallich's collection at East India House was made over to Kew (approx. 1860). This residue comprised several fairly complete sets of Wallich's duplicates. Hooker arranged for one set to be transferred to the General Herbarium and for a similar set to be put on one side and to be taken by Thomson to Calcutta.

When Thiselton-Dyer became Director of Kew he imagined that all the East India Company's museum specimens had become the property of the Secretary of State for India and that this included the Wallich Herbarium. Accordingly he wrote to the Society in 1905 applying for the transfer of the said herbarium to Kew. Council did not share Thiselton-Dyer's belief, pointing out to him that it had been unreservedly presented to the Society by the Directors of the Honourable East India Company in 1832. Nevertheless when the true cost of maintaining the Wallich collection and making it available to visitors was finally realised a Fellow's resolution in 1913 authorised the Council to offer the Wallich Herbarium together with Thomas Horsfield's to the Royal Botanic Gardens, Kew, where it now is.

Coincidentally Horsfield joined the Dutch East India Company in Java as company doctor the year of its demise (1798) and then continued to serve under Marshall Daendels until the conquest of that island by the British in 1811 when he transferred to the East India Company. When Java was returned to the Dutch (1814) Raffles (see October *Linnean*) arranged for him to continue with his researchers until he retired in 1819 when he became the first Keeper of the East India Company's Museum back in Leadenhall Street, London, where he organised the transfer of both Wallich's herbarium and his own herbarium to the Linnean Society.

From the Archives

THE WALLICH COLLECTION

Unless otherwise stated, letters are addressed to the Society or Officers thereof.

1. 1832 Jun 19. East India Company. Offers to the LS some 8,000 specimens of plants collected in India and now placed with Dr. Wallich.
2. 1832 Jun 21. Wallich, N. Seeks a meeting to discuss the East India Company proposal.
- 2a. 1832 Jun 26. LS draft of Address on vellum to thank the East India Company and accept their gift.
3. 1832 Jun 29. East India Company. Thanks Lord Stanley for the LS's thanks, and as requested will supply paper with the Company's mark.
4. 1832 Jun 29. Minutes of Committees of LS Council. East India Herbarium. Minutes dated from 29 June 1832 to 23 May 1934.
5. 1832 Jul 9. Wallich, N. to Reeves, J. Council requires £250 to do full justice to the Herbaria. Asks Reeves for a donation.
6. 1832 Sep 29. Wallich, N. Has despatched the remainder of the Herbaria. The Committee has offered to help with the distribution of duplicates.
7. 1832 Oct 5. Wallich, N. Has despatched copies of the MSS Herbarium catalogues by Rupel, Hamilton and Heyne.
8. 1840 Dec 10. LS to (?). Encloses some of Wallich's specimens marked to be returned, together with the last sheets of his catalogue.

9. 1848 Dec 30. From (?) to Wallich, N. (?). Comments on the Herbaria; they are not meant to be criticisms.
10. 1850 Apr 22. Wallich, N. Prof. Lehmann asks for the return of fal. 269 to 282.
11. 1853 Mar 16. Boott, F. Sheets of the Wallich catalogue to be sent to Trübner Nicolas.
12. 1853 Apr 13. Boott, F. All of the Wallich lithograph catalogue should be sent to Dr. Gray; he has received only the supplementary sheets.
13. 1881 Oct 27. Report of the Committee appointed to arrange the Wallichian Herbarium.
14. 1886 May. Corrected proof of official printed letter to the chiefs of each Herbarium, asking if lost Wallich numbers could be found.
15. 1886 May. Official printed letter ([see No. 14]; attached is a written list of names and numbers, initialled by Jackson 4th January 1926.
16. 1886 May. Official printed letter [see No. 14].
17. 1886 Jul 12. Official printed letter [see No. 14] giving list of numbers still missing.
18. 1886 Jul 12. [Same as No. 17].
19. 1886 Jul 12. As No. 17, with pencilled corrections made to list.
20. – – Hemsley, W.B. Mr. Bureau has returned sixteen sheets of Wallichian plants.
21. 1893 Jul 14. Harting, J.E.F. Report of the work he had been doing.
22. 1902 Oct 23. [Written note by Jackson]. The sixteen plants returned by Bureau in 1891 had been mounted and incorporated. He also reports on progress.
23. 1902 Oct 23. [Written note by Jackson]. Australian plants found at the end of the Wallichian Collection. They had been exhibited at the General Meeting in December 1883. All but four were badly injured by insects, so the entire 42 sheets had been destroyed.
24. 1902 Nov 13. Pencilled note: "99, Blank sheet".
25. 1903 Mar 3. Hemsley, W.B. According to structure the Linnean plant is *rudgea*.
- 25a. 1903. Sheets laid in, 1902.
- 25b. 1903 Jan 13. Parcel found in gallery.
- 25c. 1903 Mar 5. Report to Council about the parcel of plants found by the librarian.
- 25d. – – Lists of *Melaleuca*, *Regelia*, *Beaufortia*, *Calothamnus*.
26. 1905 Jul 31. Thiselton-Dyer, W.T. to Scott, D.D. Suggests that the Wallich collection becomes the property of Kew.
27. 1905 Oct 23. Scott, D.H. Encloses copy of Thiselton-Dyer's letter of 31 July.
28. 1905 Dec 12. Scott, D.H. Asks if there will be a meeting of the Wallich Committee on the 21st.
29. 1905 Dec 21. Minutes of the Committee on Wallich Herbarium.
30. 1906 May 20. Clarke, C.B. About the proposal to offer the Wallich Herbarium to Kew for £250.
31. 1906 May 28. Herdman, W.A. Encloses copies of letters to Scott, Monckton and Clarke.
32. 1906 May 28. Herdman, W.A. to Scott, D.H. Suggests that Council cannot itself decide to send the Herbarium to Kew or anywhere else. This can be agreed

- only at a Special General Meeting of the LS.
33. 1906 May 30. Monckton, H.W. Encloses letter [unsigned] about the legal aspect of the transfer of the Wallichian Herbarium to Kew.
 34. 1906 Jun 9. LS to Director of Kew. Encloses documentation and terms under which the presentation to Kew of the Herbarium will be submitted to Fellows.
 35. 1906 Jun 11. Director of Kew. Grateful for letter and documentation.
 36. 1909 Oct 14. Hitchcock, A.S. Seeks detailed information about Wallich's catalogue.
 37. 1913 Feb 4. Motion to be laid before Council and later before a meeting of Fellows.
 38. 1913 Feb 4. Motion [see No. 37]. That Wallich's Collection be offered to Kew. Kew to pay all expenses incurred by LS.
 39. 1913 Feb 21. Monckton, H.W. Notice about the Hooker Fund to be issued. The Wallich Collection to Kew to be on agenda for next Council Meeting.
 40. 1913. Monckton, H.W. Suggested Council procedure.
 41. 1913 Apr 4. LS to David Prain (Kew). Fellows have agreed that the Wallichian Herbarium and later additions from Horsfield and others be offered to Kew.
 42. 1913 Apr 5. Kew. Will be happy to accept the collections and conditions imposed by Council.
 43. 1913 Apr 7. LS to Crisp, F. Will hand over to Kew the plants and cabinets unless there are any legal difficulties.
 44. 1913 Apr 24. Kew. Introduces Mr. Badderly who has come to arrange for despatch of cabinets.
 45. 1913 Jun 9. LS to Kew. Cabinets are free for transit.
 46. 1913 Jun 10. Kew. Happy to hear the cabinets and contents are free for transit.
 47. 1913 Jun 24. Kew. Will send for the cabinets whenever convenient to the LS.
 48. 1913 Jun 27. Kew. Has made arrangements to start work on the Wallichian cases.
 49. 1913 Jul 24. Kew. Asks for an LS note to record that it was through the initiative of Sir F. Crisp that the Wallichian Herbarium had been presented to Kew.
 50. 1913 Sep 26. Press cutting from *The Times* about the gift from LS to Kew.
 51. Oct 4. Press cutting from *Gardener's Magazine* about the gift from LS to Kew.
 52. 1917 Apr 4. LS to Kew (originally dated 4th April 1913). The Fellows had approved of the gift of the Wallichian Herbarium to Kew.
 53. 1926 Jan 4. [Written note about the Wallichian Herbarium and the missing sheets].
 54. 1926 Jun 21. Kew. Another sheet, No.9010 missing since 1886, had been found.
 55. 1927 Jun 29. Kew. Two more sheets, Nos.9026 and 9027, had been found.
 56. 1928 Sep 7. Maxon, W.R. Will purchase copy of the Wallich catalogue. It should be sent to the Smithsonian Institution.
 57. 1928 Oct 30. LS to Wheldon & Wesley. Asks that a package be despatched to the Smithsonian Institution who will pay all costs.

CHARLES HUTT

Correspondence

20.10.95

University College,
Gower Street, London WC1E 6BT.

Dear Brian,

I read with interest A. D. Boney's account of the workings of the anti-feminist "Botanical Establishment" which succeeded in forcing Agnes Arber to resign from her appointment to the presidency of the Botanical Section of the British Association in 1921.

Reflecting on the anti-feminist attitudes within universities at the time, Boney implies that it was only at the beginning of the century that Learned Societies began admitting women to fellowship. He claims that "the Geological Society led the way in 1904, followed one year later by the Linnean Society" (*The Linnean*, 11(3), p35). No Sir, the enlightenment of entomologists occurred more than half a century earlier, for on its foundation in 1833 the Royal Entomological Society included Mrs J Curteis among its numbers. Mrs F W Hope was elected in 1835 and Mrs Vines in 1849. Perhaps the Society's most distinguished early woman fellow was Eleanor Ormerod, a pioneer of economic entomology who was elected in 1878, the same year as she was elected as the first woman fellow of the Meteorological Society. Incidentally she was the first woman to be awarded the LL.D degree *honoris causa* by the University of Edinburgh in 1900.

The Royal Entomological Society was founded by a breakaway group of entomologists, most of whom were fellows of the Linnean anyway; so had the Linnean been more generous in its attitudes towards them at the time, it might have been able to add the first election of women to its impressive list of precedents.

You will appreciate of course, that as I write from University College London which admitted women from the day it opened for business in 1828, I could not let these tardy assertions go unchallenged!

Yours sincerely
Roderick Fisher

11.x.95

Bourton Far Hill Farm,
Moreton-in-Marsh, Glos.GL56 9TN

Dear Professor Gardiner,

I write to you as editor of "The Linnean" to point out a minor mistake on p.25, Vol.11 No.3.

DOBRUKA, L.J. (1988) is almost certainly Dr. Ludek J. DOBRORUKA, who wrote in German from the Prague Zoo in the days when Czechoslovakia was under communist rule. I seem to remember corresponding with him just before he died and attended a lecture he gave on the Prezwalski Horse at the London Zoo many years ago. I know about him because I am primarily a Myriapodologist (amateur) and he wrote on centipedes as well as mammals, a not infrequent combination (i.e. R.I. Pocock etc) and I have most of his centipede publications.

Incidentally I am usually known as “Dr” because I am a medical man (M.B.Cantab) but not having a doctor’s degree am addressed by the Linnean as Mr. Eason F.L.S.! I abandoned medicine for farming and myriapodology after going hopelessly deaf during my service in the last war.

Could you point out the mistake to John Burton? In the various papers I have had published in The Zoological Journal of the Linnean Society the editor has, quite rightly, pounced on my mistakes like a terrier on a rat!

Incidentally, are you any relation to Stanley Gardiner who taught me zoology when he was professor at Cambridge in the 30’s?*

Yours sincerely,
E.H.Eason

* Not to my knowledge: Editor.

"This precious collection of letters ought to be made public..."

Remarks on the publication of the Linnaean Correspondence

“This precious collection of letters ought to be made public as it contains many hundreds of letters, wherein are treated everything curious, that has happened since 1735 until his death. Pity only that Linnaeus himself never took copies from his own letters, prevented to do that because of much work.” Those are Linnaeus’ own words about his correspondence.

Nobody but Linnaeus can have been more aware of the scientific value of his own correspondence. His correspondents, according to himself, “were the most learned and curious in Europe” who let Linnaeus know and take part in what was newly discovered by sending him letters and books. In the third of his autobiographies, that dealing with the 1760’s, he listed seventy-one correspondents from Russia and Turkey in the east to America in the west. In the years to come the number of letters and correspondents continued to grow. When Linnaeus died in 1778 more than 170 Swedish and 400 foreign correspondents had written to him. Over three thousand letters had been sent to him from Europe, America, Asia and Africa by colleagues, by admirers like Jean Jacques Rousseau and by his own students who reported to their professor from their travels all over the world.

After Linnaeus’ death the correspondence, his manuscripts, the books and the herbarium remained in the possession of the family. Linnaeus’ son Carl Linnaeus Junior, who succeeded his father as professor in botany at the University of Uppsala, added his own correspondence, books and naturalia to those of his father. Linnaeus Junior died in 1783 leaving everything to his mother, Sara Moraea, Carl von Linné’s widow. Mrs. Linnaeus who needed money to provide dowries for her four daughters decided to sell the collections. As is well known to the fellows of the Linnean Society of London, being unable to find a Swedish buyer, who could pay the required 1000 guineas sterling, Mrs. Linnaeus sold the Linnaean collections in 1784 to the young

English medical student and naturalist James Edward Smith.

In 1829 after Smith's death, the collections were transferred to The Linnean Society of London, which had been founded by Smith and other naturalists in London in 1788. The Linnaean correspondence together with the rest of Linnaeus' manuscripts, the herbarium and the greater part of his library still remain there.

Very little of his correspondence was published during his lifetime. In *Epistolarum ab Eruditis Viris ad Alb. Hallerum scriptarum* (Bern 1773) parts of the correspondence with Albrecht von Haller were printed. James Edward Smith published a selection of the letters in 1821, *A Selection of the Correspondence of Linnaeus and other naturalists from the original manuscripts*. Vol. I, II (London 1821). From the 1820's and onwards separate parts of the correspondence were edited. In 1829 came the correspondence with Alexander Garden, in 1830 with Johannes and Nic. Laur. Burmannus, in 1841 with Nicolaus Jacquin, in 1851 with Bernard Jussieu, in 1860 with Sauvages, 1861 with Johann Georg Gmelin and in 1878–1880 265 letters to and from Swedes, etc.

Towards the end of the nineteenth century the interest in Linnaeus became even more intensive than it had been previously. The image of Linnaeus as one of the Swedish national heroes becoming widespread. In 1885 the Swedish botanist, Ewald Aehrling, published the first printed catalogue of the Linnaean correspondence. In the preface Aehrling says "that even in Sweden it had been commonly recognised that the correspondence of great men demands special attention". In 1878–1879 Aehrling had taken the initiative to publish Linnaeus' correspondence with Swedes.

It was not until the first decade of the twentieth century, however, that the thought of publishing the complete correspondence re-emerged. In 1907, 200 years after the birth of Linnaeus, it was announced by the Swedish Parliament that the Linnaean letters were to be published in their entirety. Within a period of 36 years about a fourth of the correspondence was published in *Brev och skrivelser till och från Carl von Linné* (Stockholm, Uppsala 1907–1943). For various reasons the letters ceased to come out after 1943.

Fifty years later a new initiative was taken by the Swedish Linnaean Society to restart the publication of the Linnaean correspondence. In 1994 the Swedish National Bank through its research foundation consented to support the project financially. A collaboration between the Swedish Linnaean Society, The Royal Swedish Academy of Sciences, Uppsala University and its library, the Linnean Society of London and the Voltaire Foundation of the University of Oxford will hopefully lead to the realisation of Linnaeus' wish to "to make public" all the letters. This time the correspondence will be published in an international edition. All the documents will be published in their original form. The letters written in either Latin or Swedish will be given a short summary in English. Commentaries, biographies etc. will also be in English.

The first phase of the publishing project started in the summer of 1995 and consisted of listing and locating the letters to and from Linnaeus. Until now (January 1996) 5400 letters have been registered, but we expect to find many more. A request for the letters from Linnaeus to his friends and colleagues has been sent out to more than two hundred libraries all over the world. We are primarily interested in locating such letters and of course, if it is possible, in getting copies of them. We also know that many

letters are preserved for the future by interested collectors. If anyone of you who are lucky to own a manuscript or letter by Linnaeus reads this, we should be very glad to hear from you. We might even be able to provide you with new information about the autograph you possibly own.

In 1996 we will also publish a number of the letters on the Internet. (www.voltaire-foundation@ox.ac.uk). This selection will be succeeded by a preliminary inventory of the Linnaean letters.

We should appreciate knowing what you think about our project and our way of editing the letters. Send an e-mail: (Tomas.Anfalt@ub.uu.se) or a letter. Address below.

The correspondence will be published on CD-ROM except for the selection of letters and the inventory that you will soon find on the Internet. We hope to deliver the first ten years of the Linnaean Correspondence towards the end of 1997. Further information about the publication of the Linnaean Correspondence can be obtained from either Tomas Anfalt, Uppsala or Andrew Brown, Voltaire Foundation, Oxford.

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New observations on the experimental colony of the Scarlet Tiger Moth (*Panaxia dominula*) on the Wirral Way, West Kirby, Merseyside.

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AND

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The origin of the Wirral Way colony of the Scarlet Tiger Moth (*Panaxia dominula*) has been described previously (Clarke, Clarke & Cook, 1990; Clarke, Clarke & Owen, 1991, 1993; Clarke, 1993; Owen & Clarke, 1993; Clarke & Clarke, 1995). A few features are however repeated here both as a background to the latest observations and to introduce recently-discovered, unpublished records of P.M. Sheppard, who in 1961 established the colony.

In 1988 one of us (C.A.C.) caught a male f. *bimacula* in his mercury vapour light trap, about 0.5 km from the Wirral Way. He then recalled that an experimental colony of *P. dominula* had been started many years earlier by Philip Sheppard. Philip Sheppard died in 1976, but when the colony was rediscovered none of his records could be found. However, Professor W.H. Dowdeswell, searching in the Bodleian Library on our behalf, discovered a letter from Philip to E.B. Ford, written in 1961, saying that he had put down in that year on the Wirral Way about 13,000 tiny *dominula* caterpillars which had been obtained by backcrossing f. *medionigra* heterozygotes to the typical *dominula* homozygotes, and we think his stocks must have been derived, directly or indirectly, from populations from Cothill near Oxford. Philip planned an experimental colony with an initial frequency of the *medionigra* allele of 25%. Given random mating and no selection against any of the phenotypes, one could expect in subsequent generations a ratio of nine typical to six *medionigra* to one *bimacula* moths, i.e. 37.5% *medionigra* phenotypes.

The object in establishing the colony was to measure over a number of generations the frequency of the *medionigra* allele. Elsewhere, notably at Cothill and Hinksey, near Oxford, evidence had been adduced that the *medionigra* and *bimacula* forms

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were at a marked disadvantage (Sheppard & Cook, 1962), and it is fair to suggest that the expectation from this new Wirral Way colony would be a reduction in the *medionigra* allele frequency.

The Wirral Way is a former 12 mile railway line between West Kirby and Hooton which is now a popular country walk. The experimental colony had been established in a small, sheltered stretch in West Kirby where there is moderately abundant comfrey (*Symphytum* sp.), a main food plant of the caterpillars.

Apart from the letter to E.B. Ford in 1961, we could find no information about the colony in the form of field notes or anecdotal reports from friends or collaborators, except that one of us (W.W.M.) lived by the Wirral Way and had seen Philip Sheppard, whom he knew well, catching, marking and releasing moths during several seasons in the 1960s. It was this fact that enabled us to pinpoint in 1989 the location of the colony.

In 1995, i.e. just recently but 19 years after the death of P.M.S. and as a result of much correspondence, we did obtain important new information. In August 1995 Professor Doris T. Zallen, of Blacksburg, Virginia, a writer on genetical topics, with great expertise discovered Philip's notes about the Wirral Way (called by him the "Railway Bank colony") over several years. The notes had been deposited in 1985 in the library of the American Philosophical Society in Philadelphia by Professor Arthur Cain of Liverpool, which was before one of us (C.A.C.) had rediscovered the colony.

The reason Professor Cain took what may seem this rather unusual step was as follows. He had met in the USA Professor William Provine, who had just completed a biography of Sewall Wright, and Cain and Provine got to know one another well. Provine was anxious to have some of Philip Sheppard's papers (together with those of Wright, Demerec, Dobzhansky and others) in the American Philosophical Society's library in Philadelphia, and A.C. wrote to one of us (C.A.C.) in 1985 to ask if there would be any objection to Philip's papers being sent there. C.A.C. replied that there would be no objection to spare reprints and appropriate correspondence going to Philadelphia, but in general all his and P.M.S.'s joint work was sent to the Natural History Museum in London, to be with their genetic collection of Lepidoptera. Agreement would certainly not have been given to the Wirral Way notes being sent by A.C. had C.A.C. known of their existence at the time. Fortunately, however, Professor Zallen sent us copies of Philip's "Railway Bank" papers within a few weeks of finding out where they were.

Now follows a summary of Philip Sheppard's Wirral Way (Railway Bank) field notes, 1961–1976, found in 1995 and not previously published.

1. Philip confirmed that he had put down in July 1961 about 13,000 tiny caterpillars of the back-cross already described, and in the spring of 1962, when they had overwintered, he collected a sample of caterpillars (number not stated), and recorded the moths which emerged (presumably bred in captivity) from this sample.

The emergences between 28 May and 12 June 1962 were

typical	<i>medionigra</i>	bimacula	% <i>medionigra</i>
149	161	6	50.9

There should of course have been no *bimacula* from this initial backcross, and clearly there had been some errors in the parental matings, but P.M.S. gave no description of the precise origins of the 13,000 caterpillars.

There are no P.M.S. records of moths observed flying in the colony in 1962.

2. 1963 was the first year when we have P.M.S. records of moths observed in the colony, and here he carried out mark-release-recapture experiments (Fisher & Ford, 1947). His scores between 12 June and 24 July 1963 were

typical	<i>medionigra</i>	<i>bimacula</i>	% <i>medionigra</i>
136	76	15	33.5

3. In 1964 P.M.S. observed between 26 June and 21 July

typical	<i>medionigra</i>	<i>bimacula</i>	% <i>medionigra</i>
92	72	13	40.7

4. In 1965 P.M.S. observed, between 3 July and 23 July

typical	<i>medionigra</i>	<i>bimacula</i>	% <i>medionigra</i>
31	14	0	31.1

5. In 1966 P.M.S.'s observed score between 28 June and 10 July was:

typical	<i>medionigra</i>	<i>bimacula</i>	% <i>medionigra</i>
27	25	0	48.1

6. In 1967 P.M.S. observed between 4 July and 20 July

typical	<i>medionigra</i>	<i>bimacula</i>	% <i>medionigra</i>
14	17	2	51.5

7. We next come to a gap of several years in which for unknown reasons there are no notes. This may have been related partly to Philip's illness, combined with the unexpected *bimacula* findings and the unwelcome fact (to Philip) that the proportion of *medionigra* had remained high. However, in 1976 he probably thought he must have a final look, and he "assembled" using virgin females. His score (from 26 June to 2 July) was

typical	<i>medionigra</i>	<i>bimacula</i>	% <i>medionigra</i>
32	5	1	13.5

This decline in *medionigra* may have been some comfort to him before he died in October of 1976.

P.M.S. marked and recaptured moths during 1963 to 1967 and estimated the total population size of the colony using the method of Fisher and Ford (1947). His estimates are shown in Table 1, but see his comment below.

Our observations — 1989–1995

In 1989 and thereafter we proceeded as follows. Each year we took around 30 to 50 nearly fully grown caterpillars from different comfrey plants in the colony and bred them in captivity, and kept and set all the emergences. The results are shown in

Date	typical	<i>medionigra</i>	<i>bimacula</i>	<i>medionigra</i> gene freq.	population size
1961	13,000 backcross larvae			0.25	
1962	149	161	6	0.274	
1963	136	76	15	0.234	603
1964	92	72	13	0.277	275
1965	31	14	0	0.156	144
1966	27	25	0	0.240	116
1967	14	17	2	0.318	97
1976	31	5	1	0.095	
1989	36	27	5	0.272	
1990	112	35	5	0.148	
1991	76	52	1	0.209	
1992	71	30	2	0.165	
1993	59	47	0	0.222	
1994	50	36	0	0.209	
1995	38	34	2	0.257	

Table 1. The phenotypes observed in the Wirral Way colony of *Panaxia dominula* and the *medionigra* gene frequencies from 1961 to 1995. The colony population sizes from 1963 to 1967 were estimated by the late Professor P.M. Sheppard.

There was no significant difference in the proportion of phenotypes between the moths bred from the random samples of caterpillars and those observed in the wild., so that the figures for each year between 1989 and 1995 are pooled (see Table 2.).

Table 2. In addition, we visited the colony every few days during the flying season of the moth, caught those we could and scored them, and released them at the end of our visit. These results are also shown in Table 2. Owing to lack of experience we did not use the mark-release-recapture technique, and also there were doubts about its efficiency (see Singer and Wedlake, 1981; Banks, Kareiva and Lamm, 1985). In addition, there is some suggestion (Sheppard, 1951) that it may affect the ease with which specimens can be caught (which way round P.M.S. does not state) though there is a *caveat* about this for 1951.

It is possible that taking caterpillars out of a small colony had reduced it in size, but it has given us an accurate annual proportion of the various forms and this is not significantly different from that observed in the wild. The important thing is that the proportion of *medionigra* has not gone down.

The current year (1995) has not been without points of interest. First was the discovery of the original Philip Sheppard papers; second, the reappearance of two *bimacula* moths in the emergences from the sample of caterpillars; and third, we noted very poor numbers of moths seen flying in the colony, the smallest number ever recorded since the rediscovery. It will be interesting to see whether this indicates a low population in 1996.

The main point, however, relates to the frequency from year to year of the *medionigra* gene. Table 1 summarizes the records from 1961 to 1995. Since there is no difference within years in phenotype frequencies between reared and field-collected moths from 1989 to 1995, the data for each year have been pooled. It is clear that there are

Random sample i.e. up to about 50 near full grown caterpillars collected each year from the colony, bred in captivity on comfrey and all emerging moths kept, set and scored.					
Year	Dates collected n	Emergences			total
		typical	<i>medionigra</i>	<i>bimacula</i>	
1989	1.5-13.5 30	14	12	2	28
1990	1.5-9.5 26	16	7	1	24
1991	1.5-9.5 51	32	19	0	51
1992	1.5-13.5 45	32	11	0	43
1993	15.4-24.4 51	24	20	0	44
1994	18.4-28.4 51	31	17	0	48
1995	11.4-26.4 50	24	22	2	48
Moths accurately identified in colony on visits every few days, each year. (Moths only caught temporarily; none kept)					
	Dates of flying season				
1989	16.6-11.7	22	15	3	40
1990	2.6-11.7	96	28	4	128
1991	21.6-18.7	44	33	1	78
1992	6.6-5.7	39	19	2	60
1993	13.6-14.7	35	27	0	62
1994	14.6-7.7	19	19	0	38
1995	26.6-10.7	14	12	0	26

Table 2. The Wirral Way colony: data since the rediscovery.

fluctuations between years, but there is no evidence from either Philip's or our own observations on the Wirral Way that the *medionigra* gene leads to a disadvantage of the heterozygote.

This conclusion is in marked contrast to the findings from the parent (natural) colony at Cothill, where *bimacula* has not been seen since 1959 and where the *medionigra* phenotype now occurs at a frequency of less than 3% (Jones, 1989, 1993). There have also been falls in the frequency of *medionigra* in other experimental colonies (Sheppard and Cook, 1962). Owen and Goulson (1994) found that final instar caterpillars reared at a higher temperature than that experienced in the field produced a higher proportion of *medionigra*, but this finding seems very unlikely to account for our findings, about 130 miles north-west of Cothill.

Acknowledgements

We are extremely grateful to Professor Doris T. Zallen, PhD, of the Centre for Interdisciplinary Studies, Virginia Polytechnic and State University, Blacksburg, Virginia, for finding the Philip Sheppard papers, and to the Library of the American

Philosophical Society for making copies available. We are very grateful to Professor W.H. Dowdeswell for discovering the original 1961 letter from Philip Sheppard to E.B. Ford, and to Dr. L.M. Cook for checking the calculations of gene frequency and population size in Table 1. Mrs. Sally Thompson and Mrs. Angela Urion have greatly helped in the colony and with setting moths and typing, and we are indebted to the Nuffield Foundation for a grant for the work.

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Addendum

During the winter of 1995-6 the local Council, for unknown reasons to us but possibly to improve the drainage of the Wirral Way path, dug a much deeper trench than formerly, and with the digging went, as we thought, most of the comfrey, and this, coupled with the poor 1995 season as regards the number of *dominula* moths seen flying in the wild, seemed to augur badly for the 1996 season. However, on April 16th, 1996, we asked our assistant Sally Thompson to see if she could see any *dominula* caterpillars, and to our astonishment she found two, each about an inch long, and four more on the 17th. Some of the comfrey plants are now coming on well and we are hopeful that we shall get another generation of moths this year. This will make it our 8th, or the 36th since Philip Sheppard put down the initial stock.

So the colony is still in existence and we will report later on how the 1996 season proceeds.

CYRIL A. CLARKE
 17 April 1996

Inheritance of intelligence in a Pembrokeshire family

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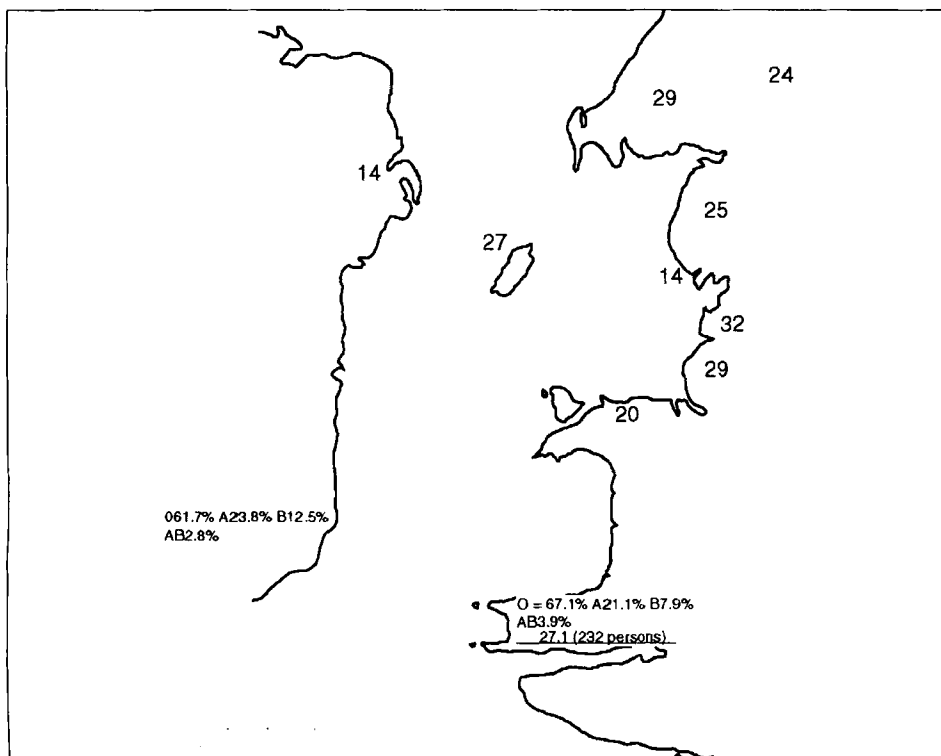
Background

Pembrokeshire in West Wales is somewhat isolated from the rest of Britain by mountains yet is a relatively lush, deeply cut plateau, mostly frost-free and served by excellent harbours. This has allowed a degree of autonomous development.

It was organised enough to export the 'blue stones' to Stonehenge millennia ago. The Romans only got as far as Carmarthen before being stopped by the Demetae and the Normans brought in Flemish mercenaries to man the 'lansker' against the Welsh Marches. The lansker running west to east across the centre of the County still acts as a language if not a blood group divide.

C9 Vikings plundered and settled and a C12 bishop of St.Davids complained because he had to speak seventeen languages (not dialects), in a Procession between his cathedral and Tenby, a journey of only about forty miles.

This paper is part of an ongoing longitudinal investigation of an extended family, elements of which are known to have lived locally at least since the C12. The ABO blood group^{1,2} distribution is closer to that of Ireland and the phenyl thiocarbamide tasting ability fits the distribution around the Irish Sea (Fig.1)³.



Figures 1. The distribution of the ABO blood groups and the non-tasting % PTC.

More recently most of these farmers mark their descent from a North Devon man in the C17. In order to avoid the unpleasantness of Judge Jefferies after the Monmouth uprising he loaded his farm onto a lugger, sailed for the lonely valleys of North Pembrokeshire and thrived there, both materially and genetically.

On pedigree analysis the inbreeding coefficient is 0.0041; close to that of the English squirearchy (0.0037). This means roughly third cousin matings to consolidate land; a practice that I can vouch still takes place in the 1990s.⁴

More specifically this particular paper demonstrates how intelligence, as measured by a modified 'Chelsea Mental Test'⁵ is inherited. There are few such family groupings, that know their distant kin, still available and it is ideal that the author is part of the group so that they will talk and can be trained to accept his sudden descents to measure them and their children for up to one hundred and thirty different features. Any bias or halo-effect is simply his and very few now refuse. Refusal itself is usually by 'foreign' spouses on the grounds of invasion of privacy.

Socially the group ranges from professional to peasant but relationships are accepted and if these people were Russian I would classify them as 'kulak'. Again, a comparatively low I.Q. does not necessarily mean poverty here. Several well-to-do farmers are virtually 'backward' millionaires. No one in the group is brilliant; (I.Q.160) but they do seem to be the bucolic leaders within the area. On this test an I.Q. of 150 is in the top 1% of the population i.e. the test has a standard deviation of 20 rather than the more popular 15 and has results rather like the Cattell III test.

The test has been criticized for being old fashioned but has proved of use elsewhere^{6,7}, and maintains continuity across the generations. It has both verbal and spatial elements in its makeup.

This approach is not unique. Psychometric variables against segregating genetic markers was advocated by Thoday (1967)⁸ as a possibility for the analysis of continuous characters in human populations.

I.Q. score and ABO blood groups were linked in a group of Oxfordshire villages (Gibson *et al* 1973)⁹ and in two Cambridge populations (Mascie-Taylor 1977 and Flight 1978)¹⁰. These were followed by an association with haptoglobin status/P.T.C. tasting (Mascie-Taylor 1983; 1984)¹¹.

Closely related compounds like P.T.C. and bearing the chemical grouping H-N-C=S are bimodally distributed as far as bitter taste is concerned and the work demonstrating simple Mendelian inheritance goes back to Blakesloe and Salmon (1931)¹⁴. In Europe the taster frequency is about 40% (gene frequency 0.5) reducing in a Westerly cline. Tasting ability shows association with several diseases such as thyrotoxicosis and carcinoma of the cervix and ovary.

Spouse selection for similar I.Q. has already been published for this family and supports other studies.

Observations

The author examined the subjects in their own homes over several decades and in all, five hundred and eighty covering four generations have been tested but of these only three hundred and twenty-nine have taken the I.Q. test either through lack of

maturity (under thirteen) or too much (sixtyfive and upwards). I have found that after eighty five years of age lack of concentration usually prevents any attempt at the test.

The following tables give the initial family data:

Midparent/Midchild correlation for I.Q. (79 pairs)	= 0.347
Husband/Wife	= 0.450
Parental mean I.Q.	= 122.8 SD 16.6
Child mean I.Q.	= 122.4 SD 17.4
Mean female I.Q.	= 119.2
Mean male I.Q.	= 124.2
1870 generation (seven persons only)	= 124.3 SD 21.8
1900 "	= 124.0 SD 13.0
1930 "	= 124.0 SD 22.4
1960 "	= 127.0 SD 14.1

Environment has a strong influence as well.

Sibling effect Mean I.Q.	Mean I.Q.	First child	Second child	Third child	Fourth + child
Singlet	129				
Two siblings		125	119.5		
Three siblings		132	127.0	122	
Four + siblings		107	124.0	129	129

Position in families	First child	Second child	Third child	Fourth child	Fifth child
Number of families (total 61)	14	16	12	11	8
Mean I.Q.	123	125	122	121	120

In keeping with other studies the fifth child is depressed by 13% with regard to the first. With 46 chromosomes, common inheritance beyond the grandparent stage, particularly for something complex, might be considered thin but at least here it is not.

Difference between I.Q. of grand parent and grand child of either sex

	Mean I.Q. difference	Number of pairs (total = 81)
Paternal grandfather	0.78	22
Paternal grandmother	1.36	30
Maternal grandmother	8.94	19
Maternal grandfather	23.81	11

Aptitude for spatial visualization (a component of I.Q.) has been linked to the X-chromosome and refuted several times.^{13,14} Here twelve pebbles were arranged in 3 x 4 rows, the subject allowed to look at them for thirty seconds; they were muddled and the person had then to set them up as before. Parents and children were compared.

Male mean correct out of 12 = 5.99

Female mean correct out of 12 = 5.52

Type	No	Correlation	p
father/son	22	0.676	0.001 u.s.
father/daughter	13	0.547	0.01
mother/daughter	16	0.747	0.001
mother/son	16	0.581	0.05

The two above tables would bear further examination by experiment.

What follows is simply the correlation of I.Q. in kinship pairs and much simply confirms other studies. The high correlation at 3rd cousin level reflects the degree of inbreeding.

First degree	r	No pairs	Second degree	r	No pairs
Father/son	0.37	62	Grandfather/ grandson	0.48	19
Father/daughter	0.24	56	Grandfather/ granddaughter	0.76	18
Mother/son	0.51	57	Grandmother/ grandson	0.22	26
Mother/daughter	0.08	62	Grandmother/ granddaughter	0.28	32
Third degree			Uncle/nephew	0.04	41
1st cousin male/ 1st cousin female	0.06	75	Uncle/niece	0.095	64
1st cousin female/ 1st cousin female	0.13	79	Aunt/nephew	0.016	79
1st cousin male/ 1st cousin female	0.061	34	Aunt/niece	0.008	26
Fourth degree			Fifth degree		
2nd cousin male/ 2nd cousin male	0.058	86	3rd cousin male/ 3rd cousin male	0.64	155
2nd cousin female/ 2nd cousin female	0.25	97	3rd cousin female/ 3rd cousin female	0.55	66
2nd cousin male/ 2nd cousin female	0.09	115	3rd cousin male/ 3rd cousin female	0.71	48

This table of 'mean I.Q. difference' in first cousins is 9,6,4,2,8,5,10,3,7,1, by descent. The descending order from Lasken's table¹⁵ is 4, (285), (96) (10 3 7 1). The similarity

Cousin German variation	No pairs	Variance difference	Mean I.Q. difference of paired first cousins
1. Female & father's brother's daughter	15	387.026	12.47 SD 10.86
2. Male & mother's brother's daughter	11	13.502	13.09 SD 11.41
3. Female & father's sister's daughter	70	155.372	14.00 SD 13.63
4. Male & mother's sister's daughter	17	37.109	14.28 SD 9.05
5. Female & mother's sister's daughter	12	256.616	16.93 SD 7.73
6. Male & mother's sister's son	11	78.316	17.27 SD 12.34
7. Male and father's sister's daughter	22	251.364	19.41 SD 13.52
8. Male & father's sister's son	24	387.026	20.42 SD 12.48
9. Male & father's brother's daughter	36	309.513	21.22 SD 19.05
10. Male & father's brother's son	12	169.411	21.58 SD 12.69

suggests some small sex influence but in a study of this size it is too small to be revealed satisfactorily and may not be strictly sex-linked in its entirety

If not sex linkage what about the following autogenetic associations? Four features stand out so far. The ability or not to tube one's tongue; wet or dry ear wax; phenylcarbamide tasting and cephalic index. The last named more pronounced in the female than the male and supporting the local prejudice that 'long heads' were brightest.

I.Q. band	136+	135-121	120-101	100<
Male cephalic index	78.15 (38) SD 3.14	79.77 (58) SD 3.87	81.62 (23) SD 5.27	80.10 (19) SD 3.19
Female cephalic index	78.32 (28) SD 3.66	80.41 (65) SD 3.31	80.96 (29) SD 4.49	81.10 (18) SD 3.88

This result I consider the more remarkable considering the original racial diversity and since there is no correlation with height.

P.T.C. tasting¹ provides something of a problem. The graph (Fig. 2) shows that there is a very rough percentage increase in the number of positive tasters as the I.Q. rises. This is quite the opposite of Mascie-Taylor's study around Cambridge on the other side of the island.

It has been suggested that one family line has an overwhelming number of people who are dim and cannot taste P.T.C. but a glance at the pedigree will show that lack of intellect is widespread. I could suggest a cline but think Britain too small for that. Nevertheless, the following calculation shows a strong effect. It was calculated very kindly by Dr. Mascie-Taylor himself.

In accordance with previous results there was no sex-PTC association. The number of tasters and non-tasters were in accordance with published results (Morant *et al* 1976 $z = 1.01$ pNS). The gene frequency of the non-taster allele approximately 0.55.

The relationship between I.Q. and taster was determined by analysis of variance with two main effects, sex and taster status.

Sample by sex and PTC status

Sex	Non-taster	Taster	Total
Male	36	86	122
Female	40	85	125
Total	76	171	247

ANOVA of I.Q. by sex and PTC status

Item	SS	df	Mean Square	F	p
Sex	413.514	1	413.514	1.159	0.283
PTC	2230.605	1	2230.605	6.253	0.013
Sex-PTC interaction	131.354	1	131.354	0.545	0.545
Residual	86678.438	243	356.701		
Total	89507.750	246			

Only PTC status showed a significant effect.

¹ Tested by crystal tasting.

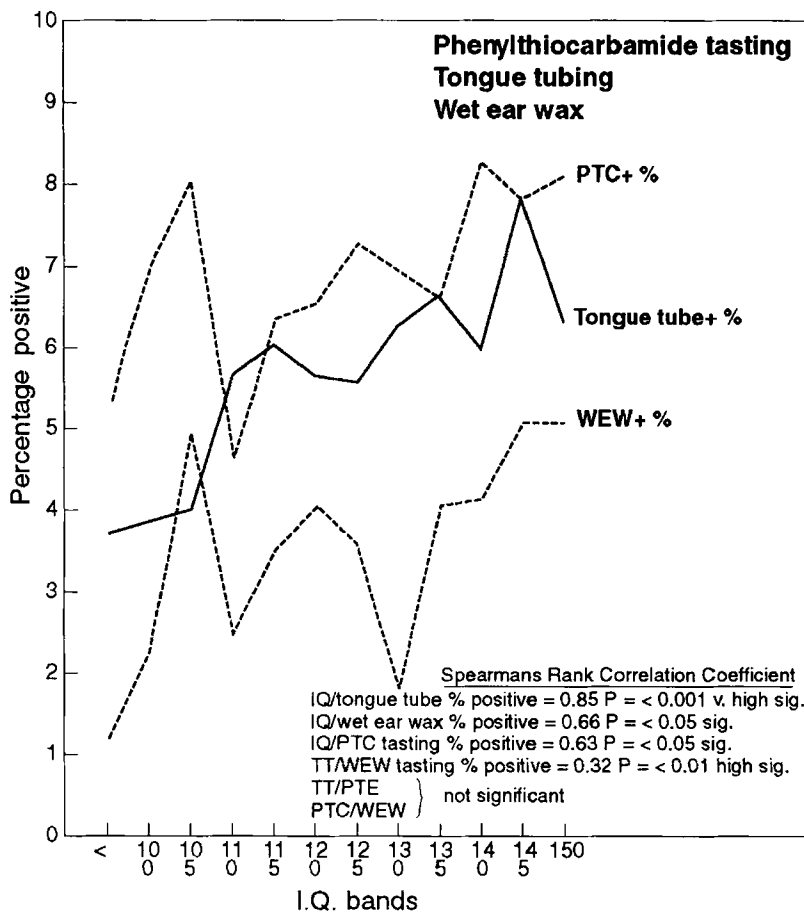


Figure 2. Stepped Range of I.Q. in Five Point bands for three test comparisons (SD 20)

The Multiple Classification Analysis presents the results for each sex and PTC status as deviations from the grand mean.

Multiple Classification analysis

Sex	N	Adjusted deviations
Male	122	+ 1.39
Female	125	- 1.36
PTC		
Non-taster	76	- 4.51
Taster	171	+ 2.00

It is clear that tasters of PTC score over 6.5 I.Q. points higher on average than do non-tasters. Tongue tubing is from side to side as in spitting; not the cloverleaf lateral form and 'wet ear wax' produces 'runny ears' not the dry caking form (I do not think that this corresponds to the grey dry Japanese feature).

Discussion and Results

When looking at all three graphs (Fig. 2) one could imagine in each case the rough fusion of three distinct populations.

A criticism of this sort of study is that if one uses a small enough sample one can prove most things but I am sure that, even with these numbers, trends can be revealed and it does no good to be scientifically too timid (especially when employment is not in question).

As far back as 1915 Porters worked out a system for intellectual inheritance and in 1931 Hurst C.C. developed a hexagenic method of inheritance which helped to explain several problems of family ability. In 1992 Volkmar Weiss¹⁷ refined the concept with an ingenious show of simplicity, suggesting that I.Q. 119+ (SD 15) set two genetic levels, (on my test this would be about 124+). Mendelian segregation supported a major gene focus M_1 M_1/M_2 M_2 (gene frequency $M_1 = 0.02$). Using the Hardy-Weinberg Law of population the following pattern was obtained: M_1M_1 (I.Q. 140); M_1M_2 (I.Q. 124); M_2M_2 (I.Q. 92).

Percentage ranges of offspring I.Q.

Marriage combination	Expected range	Weiss Empirical Range	James Empirical Range
Both spouses 119+ (SD15)	75-100	81	84.4 (124 SD20)
One spouse 119+	50-75	62	63.1
Both spouses 118-	25-50	30	40.0
Both spouses <105	0.25	20	20.0

I would attribute my expanded tail to a tendency for brain damage by circumnatale jaundice, relatively common in the local population.

The M gene could be a single gene or an array. It does not matter.

As one steps away in a relationship as in aunt/uncle versus nephew/niece the similarities show the expected fading of probability:

Nephew/Niece

Aunt/Uncle 124+	75.46% >124	Mean 130.1 SD 15.3 (134 persons)
Aunt/Uncle <124	58.0% <124	Mean 117.0 SD 18.9 (119 persons)

I would suggest that the triple humps seen in the previous graphs represent the three populations (a) M_1 M_1 (b) M_1 M_2 (c) M_2 M_2 . On top of this, very practical things like birth weight can detract or enhance performance.

Mean Male birth weight 3297.96g

Mean Female birth weight 3189.38g

Male IQ	Mean	N	Female IQ	Mean	N
140+	3170.4g	12	140+	3378.8g	11
120-139	3247.8g	16	120-139	3117.1g	20
90-119	3595.4g	11	90-119	3159.3g	9

The lightest babies 1816g to 2724g average by I.Q. only 117.6. The heaviest 4585+g also shows only a score of 119.5. The old-fashioned "7.25 pounder" still shows the optimum condition and a score of 124.

The individual distribution map (Fig. 3) shows the locality of the people the author has actually tested. They are concentrated on the Dale peninsular only and the upper shore of the River Cleddau; a major site of Norse settlement. As more material is

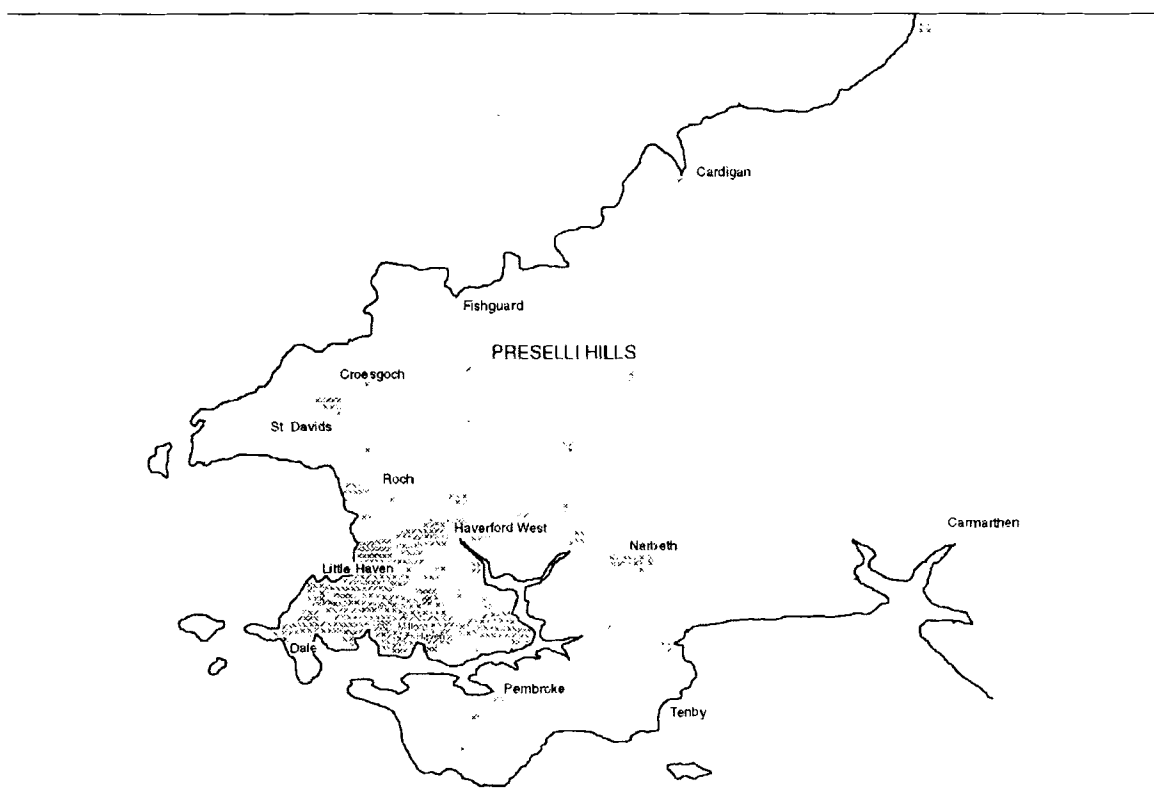


Figure 3. Individual distribution of those examined within Dyfed.

collected the statistics should become clearer and with the advent of new enzyme tasting kits the M gene itself will be located. Already glutathione S-transferase seems a likely candidate.

It has been demonstrated before that within a family, those with more genes in common show a closer I.Q. This might be the way to proceed further in this study where simple methods must be used.

Acknowledgements

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Library

This issue is being prepared using new computers recently installed: hopefully this should eventually lead to new library automation systems. Meanwhile we will continue to produce catalogue cards but may also have a limited search facility available for use by Fellows. All this does mean that we are trying to learn new systems whilst doing all the other tasks so please be patient if we seem distracted or self absorbed: new computers take a lot of time to get accustomed to!

We will be employing our usual team of students this summer to continue with the annual task of cleaning, reshelving and sorting out the Library stock. This year we hope to make a start on the *faunas*: continuing the pattern of work begun last year with the *floras*. If you are likely to need quick access to such books during the later part of July or August please ring beforehand as we may need to find them in temporary locations.

We had a small section of the Australian journals damaged by minor flooding just before Easter. Luckily we have managed to salvage most but there were some issues of *National Wildlife* and some other Australian bulletins and reports which were beyond salvage. We are checking these gaps at the moment but any help in locating possible replacement copies would be welcomed.

Donations October 1995 – April 1996

Once more, we have excluded from this list any of the large quantities of conservation-related materials (books, journals and papers) coming into the Library from Prof. G.Ll. Lucas as well as regular gifts of journals by Dr Burdet, Mr B.O.C. Gardiner, Prof. Pontecorvo, Prof. Mark Seaward and others. This is just to avoid occupying more space than the Editor would permit. We are most grateful to these and all others who have given us items which may not have reached these listings yet!

A further book sale is planned for November 1996. As before we welcome ANY donations (not just Natural History) but do prefer to receive material well ahead of the sale so that they can be checked to see if they can fill gaps in the Library holdings rather than being put into the sale. The last sale realized nearly £200 which has gone into the Library purchase fund, and there were also a lot of books which were added to the Library, especially from the London Natural History Society.

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Book Reviews

Marine Algae of Northern Ireland, by Osborne Morton.

Published by Ulster Museum, Botanic Gardens, Belfast, Northern Ireland. 1994. 123pp 16 colour plates, 1 b/w plate, 1 map. ISBN 0-900761-228-8. Price £6.98 sterling (excludes post and packaging) from The Ulster Museum.

The introductory chapter explains the arrangement of the work, analyses all marine algal/seaweed distribution records, places the seaweeds of Northern Ireland into a broader phycogeographical context, and provides an historical account of collecting in the province. Generic and species entries follow in alphabetical arrangement under the traditionally-recognised major classes: Chlorophyta, Phaeophyta and Rhodophyta. Each entry includes minimal information on synonymy, a brief ecological account, data on sites of occurrence in the province's three counties, the name of collector, determiner, author or recorder, and where voucher material is deposited. The next three chapters explain the symbols and abbreviations used in the text and provide a topographical index of sites or gazetteer. Sixteen colour plates are included along with a glossary of technical terms. Before the glossary are two lists of references, one of works frequently cited and the other of less commonly mentioned ones.

The publication unquestionably fulfils its principal aim of providing a modern compendium of information on the 356 marine algae or seaweeds known from Northern Ireland. It contains much new information from unpublished sources including that taken from herbarium sheets and survey reports. A useful feature is the linking of published and unpublished records to voucher specimens, so addressing one of the greatest problems in assessing earlier records, namely the need to re-examine material on which the identification of taxa was based. The work is written very much with the specialist in mind and is not a 'Flora' as the title misleadingly suggests since it is

lacking identification keys, descriptions and illustrations except for a few colour plates. The glossary of technical terms is therefore unnecessary as are the superb colour photographs, especially those depicting common seaweeds and an unidentified 'Codiaceae'. An unnecessary complication is the separation of the references into two terminal lists based on their frequency of usage.

Any phycologist with an interest in the seaweeds of the British Isles will find much of interest in this authoritatively-written reference volume. The 123-paged volume with its 16 colour photographs is remarkably good value for money at just under £7 sterling.

DAVID M. JOHN

Views from the Bridge, a memoir on the freshwater fishes of Trinidad, by Julian S. Kenny. Published by and available from the author, 26 Valley View Drive, Maracas, St. Joseph, Trinidad & Tobago, fax 809-662-5466, and Rapid Environmental Assessments Limited, 74 Ana Street, Port of Spain, Trinidad and Tobago, fax 809-622-8809, £19.99, plus £4.00 Postage Airmail. ISBN 976-8136-74-X (Pbk). 1995.

Jake Kenny has involved himself in the biology of Trinidad and in the biological education of Trinidadians and others for over 40 years. This privately published volume is a reflection on his career and especially on his interests in the freshwater fishes of his country, situated off the South American mainland, close to the Orinoco drainage. In ichthyological circles Trinidad will forever be famous for giving to the world the Guppy, but the fish fauna is rich and varied, as indeed is all the biota, as would be expected of a neotropical continental island.

The volume is 98 pages long with 6 pages of black and white photographic plates and over 50 figures, mostly distribution maps of Trinidadian freshwater fishes, within that Island. Firstly the detractioons of the work; there are a number of minor errors and lapses which probably would have been caught had publication gone via another route, although on that there can be no guarantees. However, these are mostly trifles and result in the reader being forced to pay more attention than with a perfect text. The attractions of the volume are many, not least the individual and idiosyncratic approach, free from the often sterile editorial constraints. The text is a mixture of fact and speculation, but mostly the former, documenting what is known of the distribution of the fishes within that Island, and speculations supported with but a few facts on the possible historical genesis of Trinidad as an island, and evidence is presented for this occurring as recently as the first millennium A.D. Continuing colonisation and extinction are documented as occurring along the south coast of the Island which faces onto the Orinoco and associated drainage. But there are older distribution patterns reflecting both South American and Antillean relationships, and perhaps beyond. As always with biogeography, evolution and systematics are both implicit and explicit in the synthesis. On systematics, Kenny makes the point of a need for a definitive account of the freshwater fishes, and I would certainly welcome such an addition, especially if South American and Antillean distributions of the Island's species could be covered. Indeed a strong case can be made for a Fauna of Trinidad series, and given Kenny's new role as an independent parliamentarian in the Senate in Trinidad, perhaps such a

goal might be expressed; the understanding of biodiversity demands cultural knowledge of that biodiversity.

If Kenny's thesis is supported by additional coring data and Trinidad is indeed historically very young, the Island would then present ecological and historical biogeography with some fascinating problems of vicariance, local colonisations and extinctions, and range extensions and contractions. Jake Kenny is thus to be congratulated for writing this memoir in his retirement and his "indulgence" thus shared certainly generates much reflection and thought on the origins and ecology of the fishes of Trinidad and beyond, and possible directions of further research on that twin island nation's biota.

ROBIN BRUCE

The Furthest Shore. Images of Terra Australis from the Middle Ages to Captain Cook. by William Eisler publ. Cambridge University Press, Cambridge, UK., 1995., xi + 180 illustr., h/b ISBN 0-521-39268-3. Price £45.00., US\$65.00.

Pythagoras originated the idea that there ought to be a large continent in the southern hemisphere to balance, as it were, the landmass of Europe and Asia in the northern one, and this belief persisted for more than two thousand years until it was dispelled by James Cook's voyage in the course of which he landed on the east coast of Australia, New Zealand and Tahiti. In 1541 Gerard Mercator published a map of the world which shows a massive *Terra Australis* covering the southern parts of the globe. Previously Ferdinand Magellan in the first part of his voyage to circumnavigate the world had discovered the strait, now named after him, that separates Tierra del Fuego from South America. Tierra del Fuego was thought to be a promontory of *Terra Australis*. Later Francis Drake in his circumnavigation showed that this is not the case when he rounded Cape Horn and demonstrated that there is no landmass lying farther south.

This book considers the various maps that were published from the *Mappa mundi* of Osma Beatus which appeared in the eleventh century to Alexander Dalrymple's *Chart of the South Pacific Ocean* (1767). As well as figuring the maps, it is lavishly illustrated with pictures of plants and animals and the inhabitants of New Guinea and other islands. There are fifteen colour plates, apart from the 81 illustrations in the text. The author discusses the various ideas of *Terra Australis* held in antiquity, the Middle Ages and the Renaissance. He goes on to describe what he calls 'the Spanish vision', in particular the romantic views of Pedro Fernandez de Quiros. He has a chapter on the more down to earth ideas held in Elizabethan England. The second half of the book is concerned with the Dutch expeditions in the seventeenth century. Willem Jansz explored the southern coast of New Guinea and was the first European to land on the Australian coast. He was followed by Torres who sailed through the strait now named after him, van Diemen who discovered van Diemen's Land, now called New South Wales and Tasman who discovered Tasmania and then on his second voyage explored the northern coast of Australia.

The whole work is a most detailed account of an interesting subject.

FRANK BRIGHTMAN.