

TRAVELS NOW AND THEN

© Christopher Earls Brennen

JAPAN 2004

Fri. Feb.27

Fly UA891 from Los Angeles to Narita, Tokyo.

Wed. Mar.3

Fly UA890 from Narita, Tokyo, to Los Angeles.

[Back to table of contents](#)

Last updated 7/30/99.

Christopher E. Brennen

TRAVELS NOW AND THEN

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BAJA 2004

Summer, 2004. Doreen and I along with Dana and her children and Kathy and her children drove down to Baja, California to a coastal resort hotel just south of Rosarito Beach (perhaps Punta Azul?) where we vacationed for several days.



Baja Hotel



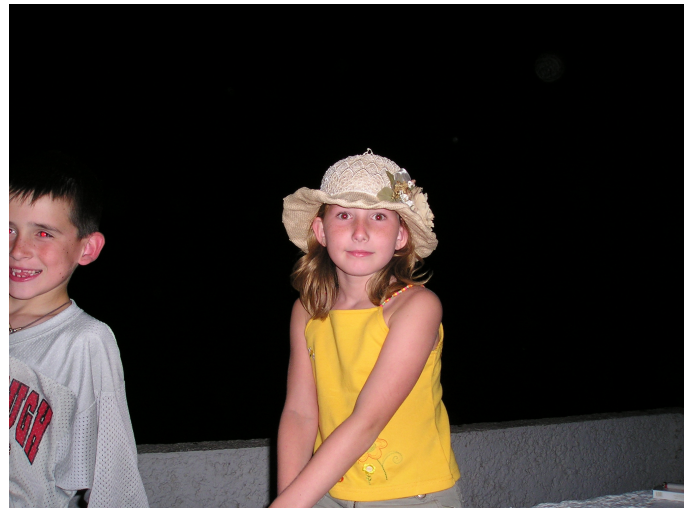
Baja Hotel



Baja Hotel



Baja Hotel



Baja Hotel



Baja Hotel



Baja Hotel



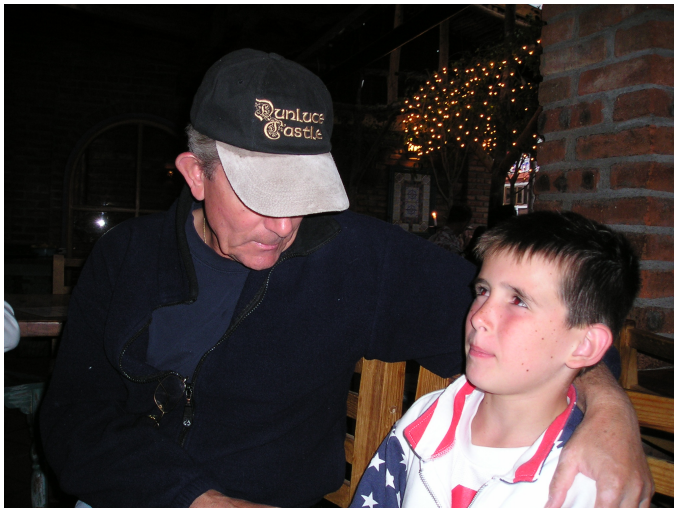
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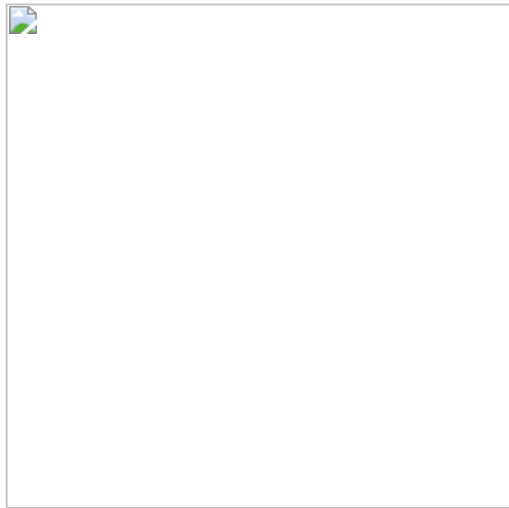




Baja Hotel



Baja Hotel



[Back to table of contents](#)

*Last updated 7/30/99.
Christopher E. Brennen*

England, Ireland, August/September 2004. C.E.Brennen.

Aug. 17 Tues Fly UA LAX to SFO 9.50am-11.09am (VZLNKU)
SFO to LHR

Aug. 18 Wed Arrive Heathrow Dinner – Three Magpies?
Stay Park Inn, Heathrow (La Meridien)(XDPLD)

Aug. 19 Thurs Avis Car rental 9am (33332896US2)
Drive to Stratford – check in Blue Boar Inn
Royal Shakespeare Theater seats Q5,Q6,Q7
Stay in Blue Boar Inn

Aug. 20 Fri
Stay in Blue Boar Inn

Aug. 21 Sat
Stay ??

Aug. 22 Sun Fly BHX to ORK AerArann406. 19.45-21.15pm
Avis Rental Car at Cork (37713474US1)
Travelodge Kinsale Road Roundabout (127844632)

Aug. 23 Mon Drive to Portmagee Pier (Kenneth Roddy)
Trip to Skellig Michael (Kenneth/Joe Roddy)
Stay in Scariff Inn, Caherdaniel

Aug. 24 Tues
Stay in Scariff Inn, Caherdaniel

Aug. 25 Wed

Aug. 26 Thurs

Aug. 27 Fri
Fly AerArann303 ORK – BHR 17.25-18.35
Avis Rental Car (37714458US5) at Belfast Harbor
Stay at Mills

Aug. 28 Sat

Aug. 29 Sun

Aug. 30 Mon

Aug. 31 Tues

Sep. 1 Wed

Sep. 2 Thurs

Sep. 3 Fri

Sep. 4 Sat

Sep. 5 Sun

Sep. 6 Mon Lunch w. Derrick Crothers

Sep. 7 Tues Fly BHS-LHR BM 11.05-12.30pm
Fly UA LHR-IAD 4.30pm-
IAD-LAX - 11pm

TRAVELS NOW AND THEN

© Christopher Earls Brennan

IRELAND 2004

IRELAND 2004 *Left at Roundabout
Row hill - lights (right)
STATOIL - turn in before it*

England, Ireland, August/September 2004. C.E.Brennan.

UA = 1-800-225-8900

UK = 0845-844-4777

~~First~~ NUMBER = 00024-188-450

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IAD-LAX - 11pm

UK 0845-844-4777

(VZLNKU)

00024-188-450

holidayextras

Holiday Extras
Newingreen
Hythe
Kent CT21 4JF
Tel: 0870 844 4300
Fax: 0870 844 4310

DR C BRENNEN
360 OLIVE TREE LANE
SIERRA MADRE
CALIFORNIA, USA
91024

Friday, May 28, 2004

Ref: Re-branding of the Le Meridien Heathrow

Clients Name: **DR C BRENNEN**
Arrival Date: **18/8/04**
ABC Booking Ref: **XDPLD**

Dear ,

Thank you for booking your overnight stay with Holiday Extras, I am writing to inform you of a change of name to the hotel you have booked.

The hotel, formerly known as the Le Meridien Heathrow has been re-branded as the **Park Inn Heathrow** and the signage has been changed accordingly.

Should you have any queries do not hesitate to contact us on: 0870 844 4311.

Yours sincerely



Ian Stewart
Commercial Director

Jacket Potatoes

Served with a generous salad & a choice of the following toppings:

✓ Beans	£3.95
✓ Cheese & Onion	£3.95
Tuna Cheese Melt	£3.95
Tuna Mayo	£3.95
✓ 5 Bean Chili <small>NEW</small>	£3.95
Prawns & Seafood Sauce	£3.95
✓ Coleslaw	£3.95
✓ Peppered Stilton Mushrooms	£3.95

Mushrooms topped with creamy peppered sauce & melted Stilton.

Sandwiches & Baguettes

A soft white baguette or sliced multigrain brown bread filled with your choice of toppings. May we recommend a portion of chips as an accompaniment.

		with chips
Ham & Cheese Sandwich <small>NEW</small>	£3.95	£4.95
Served with apple chutney.		
✓ Brie & Mushroom Melt	£3.95	£4.95
Hot mushrooms topped with melted Brie.		
BLT	£3.45	£4.45
Bacon, lettuce & tomato.		
Prawn	£3.95	£4.95
Prawns with a seafood sauce.		
Cajun	£3.95	£4.95
Spicy chicken with mayonnaise.		
Brie & Bacon	£3.95	£4.95
Cheese & bacon with a difference.		
Tuna Mayo	£3.45	£4.45
Tuna & mayonnaise.		
Tuna & Cheese Melt	£3.45	£4.45
Tuna & mayonnaise topped with melted cheddar cheese.		
Steak, Onion & Mushrooms	£4.45	£5.45
Prime rump steak with wholegrain mustard, onions & mushrooms.		
New York Style Chicken Melt	£3.95	£4.95
Chicken, bacon, melted cheese & BBQ sauce.		
Scampi & Tartare Sauce <small>NEW</small>	£3.95	£4.95
Deep-fried wholemeal scampi in breadcrumbs with tartare sauce.		
Sausage & Onion	£3.45	£4.45
Pork sausages with fried onions.		
Beef & Gravy Baguette <small>NEW</small>	£4.45	£5.45
Warm beef in a rich gravy served in a tasty baguette.		

Side Orders

✓ Side Order Combo <small>NEW</small>	£2.95
✓ Chips	£1.65
✓ Garlic Bread	£1.55
✓ Cheesy Garlic Bread	£1.85
✓ Flat Mushrooms <small>NEW</small>	£1.95
✓ Side Salad	£1.95
✓ Onion Rings™	£1.45

Join us for Sunday Lunch
only £6.45

Why not join us on a Sunday for a roast, served with roast potatoes & seasonal vegetables. Also available in a smaller portion for the lighter appetite.

KID'S MENU

All served with a **FREE** children's ice cream dessert & a **FREE** children's Pepsi, lemonade or Fruit Shoot

For only £3.50

Mini Combo
Onion rings*, sausages, jacket potato wedges, garlic bread & baked beans.
Sausage & Mash
✓ Tomato Pasta
Pasta with a tomato sauce topped with melted cheese & served with garlic bread.
All the dishes below are served with either chips, new potatoes or mashed potato & either peas, vegetables, salad or baked beans.
Fish Fingers
Pieces of formed fish in breadcrumbs.
A Chicken Breast
With melted cheese & BBQ sauce.
Burger
With cheese or plain & simple.
Popcorn Chicken
Pieces of formed chicken in breadcrumbs.
Hot Dog
✓ Cheese & Tomato Pizza

LATE LUNCH DISCOUNT
EARLY DINING

25% Off

25% off the price of all meals* ordered between 2.30pm - 6.00pm available Monday to Friday.

* Applies to food items only. Offer excludes any other promotional meal deals, Bank Holidays & Christmas Menus.

All major credit cards accepted
Cheques must be supported by a valid banker's card

† Not suitable for vegetarians. ‡ All weights are approximate uncooked weights.

*** Battered fish used is either cod or haddock where available.

† Pieces of formed onion in a battered ring & deep-fried.

We strive to ensure that all our customers enjoy both their visits & their meals.

If for any reason you are disappointed with us, please let any member of staff know straight away so that we can rectify any problems.

© 2003 Spirit Group Limited, 107 Station Street, Burton Upon Trent, Staffordshire, DE14 1BZ. Tel: 01283 545320
www.thespiritgroup.com

SAP84

Succulent
STEAKS

Takeaway
Menu



THE THREE MAGPIES

Bath Road, Heathrow,
Hounslow, Middlesex TW6 2AU
Tel: 0208 7591071



PARK INN HEATHROW

BATH ROAD
WEST DRAYTON
MIDDLESEX UB7 0DU

Pg. 1 18AUG 04 09:25 19AUG 04
ROOM: S A L E S I N V O I C E S T A T E M E N 5613 0818-4909

BRENNEN C
360 OLIVE TREE HOLIDAY EXTRAS /FIT
SIERRA MADRE XDPLD/SEG625
91024
USA

BILL HOLIDAY EXTRAS /FIT NO. : 39
NEWINGREEN
HYTHE
KENT CT21 4JF
UNITED KINGDOM

S A L E S I N V O I C E

18AUG	301650	LE BAR	14.31
19AUG	100882	CARVERY BREAKFAST	33.64

* BALANCE INCL. VAT 47.95

SALES	=	NETT	+	VAT	@	VAT%
7.11		7.11		.00		.00
40.84		34.76		6.08		17.50
47.95						

VISA CARD PAYMENT 47.95CR

THANK YOU FOR STAYING AT
PARK INN HEATHROW

Park Inn Heathrow, London
Bath Road Heathrow Middlesex UB7 0DU United Kingdom
T: +44 20 8759 6611 F: +44 20 8759 3421
info.heathrow@rezidorparkinn.com
Park Hotel Heathrow Ltd.
Company No. 5064006 VAT No. 832 7692 07

www.parkinn.co.uk

by REZIDOR



Balliol College, Oxford and Minister Lovell

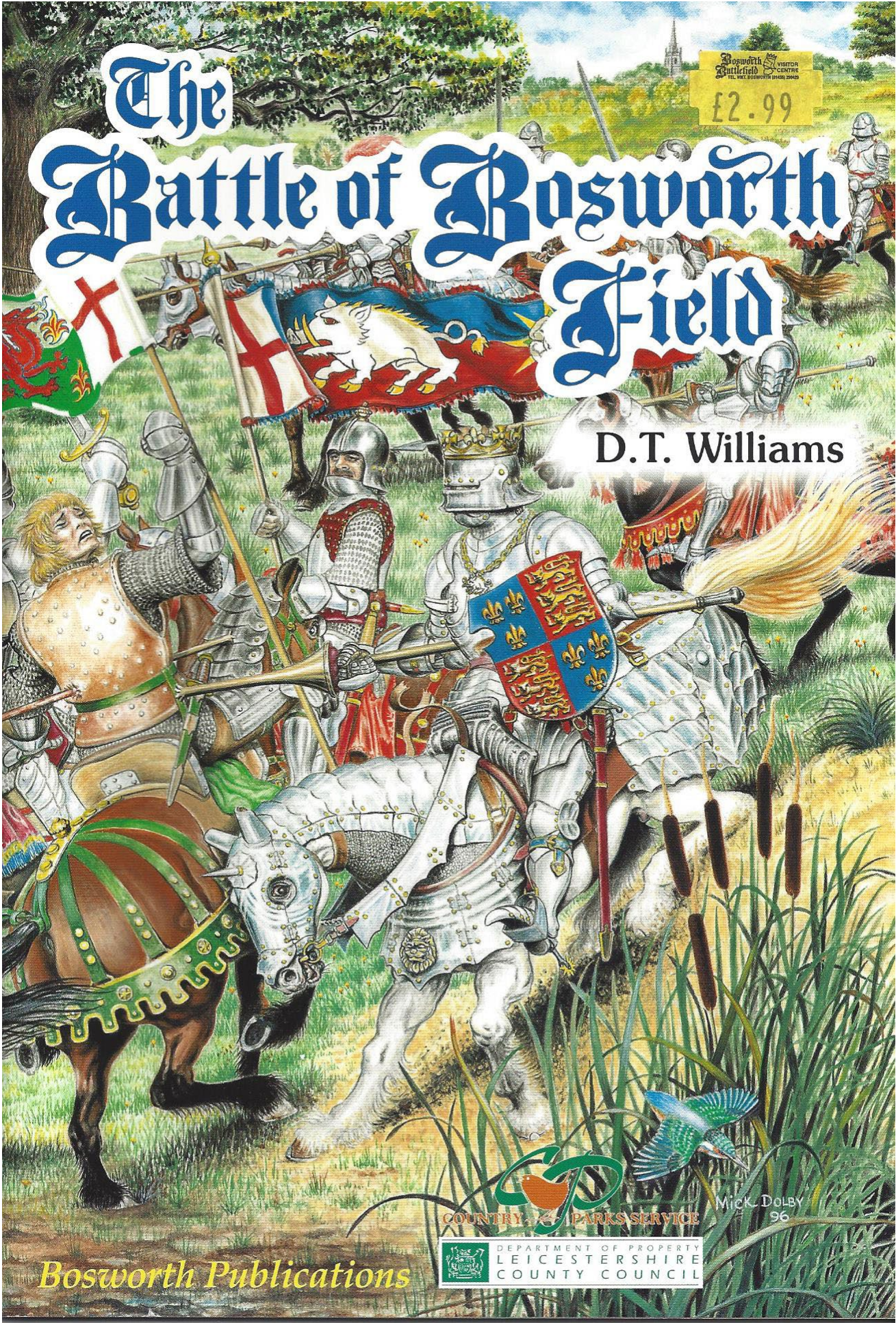


Minister Lovell and Bosworth Field

English#Heritage

Minster Lovell Hall





The Battle of Bosworth Field 1485

The legend of Dadlington Field and other battle sites

In the lead up to the celebrations that marked the 500th Anniversary of the Battle of Bosworth in 1985, public debate intensified regarding an alternative location to the current battle site that was championed by Danny Williams and interpreted by Leicestershire County Council. New documentary evidence was unveiled that suggested a different location, and the legend of Dadlington Field was created. Fuelled by media interest in Richard III, "England's Black Legend" and the most controversial of English monarchs, as well as a proliferation of new books on the subject of his life and death, the debate achieved national prominence.

Numerous other books have since been written and theories put forward as to the location of what is one of the three most important battles in English History. This culminated in 2002 when Michael Jones published a book entitled "Bosworth 1485: psychology of a battle." In this book Jones

moved the battle site some four miles from the traditional site at Ambion Hill to the villages near Atherstone, on the Leicestershire/Warwickshire county border.

What is the present position with regard to the debate as to the location of the battle of Bosworth?

Was Richard doomed by acts of treachery? Or were his own mistakes, exploited by his rival's tactical brilliance, the cause of his downfall?

Are we any nearer to solving these puzzles?

Can we finally determine where the last Plantagenet monarch, and the last English king to die leading his troops into battle, met his fate?

This leaflet sets out the principal theories relating to the location of the battle that are currently being researched, together with sources for further reading. The positions and locations of the armies prior to battle are discussed, but no description of the actual battle is included here. Most authors are agreed on the course of the fighting, and an explanatory account can be found in the Battlefield Guidebook.

D. T. Williams - 1973

This is the battlefield theory presently interpreted at the Bosworth Battlefield Visitor Centre and Country Park. It forms the basis of the Battlefield Trail on the site and is the account set out in the Guide Book on sale at the Visitor Centre shop.

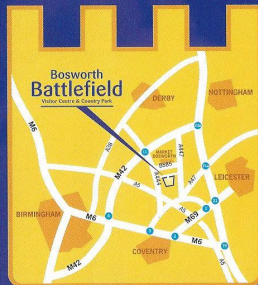
Access to the Battlefield

Access to Williams' battlefield interpretation is provided via the Battlefield Visitor Centre and along the sign posted Battlefield Trail.

Reading

Williams, D. T. (2001) The Battle of Bosworth Field, Leicestershire County Council, Leicestershire (Battlefield Guidebook).

Williams, D. (1985) The Ricardian, VII, 86 - 96.



Opening times:

The Battlefield Centre and Buttery are open from March to December.

1st April to 31st October:

Every day, 11am to 5pm

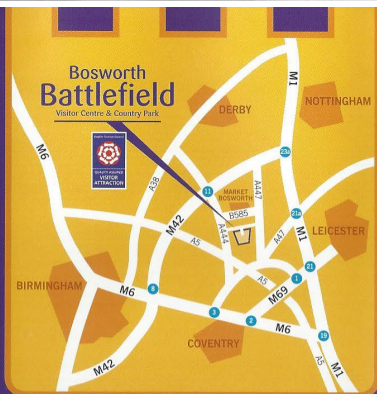
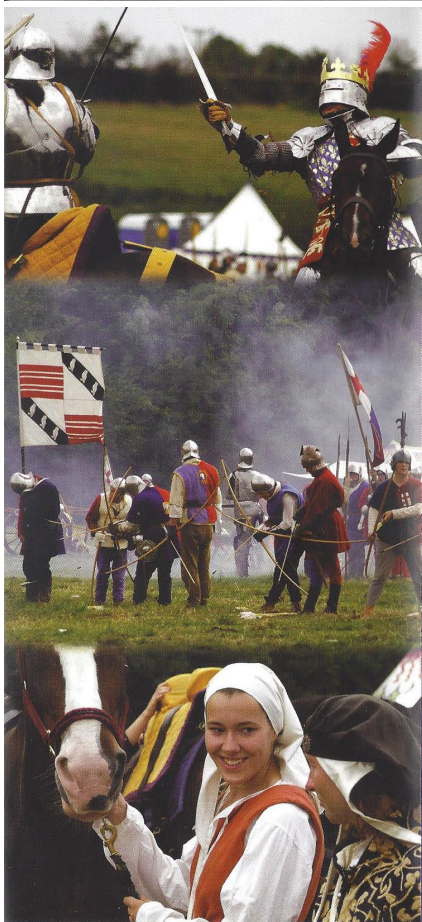
November to December

Sundays only, 11am to 4pm

March

Sat & Sunday only, 11am to 5pm

The Country Park and its waymarked paths are open all year.



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November & December: Sundays only, 11am to 4pm

March: Sat & Sun only, 11am to 5pm

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Entrance charges:

Adults £3.25 Concessions £2.25
Families £8.50 Car Parking £1.00

Special Family Ticket £6.00 Mon to Fri during school holidays

Special charges apply on living history and event days.

Special rates for school and group visits.

Electric scooter available - phone for details.

Improvements:

The first phase of the the revitalisation and redevelopment of the the Battlefield starts this year with the building of a new restaurant.

For more information contact:

Bosworth Battlefield Visitor Centre & Country Park
Sutton Cheney, Nr Market Bosworth, Nuneaton, CV13 0AD

Telephone 01455 290429

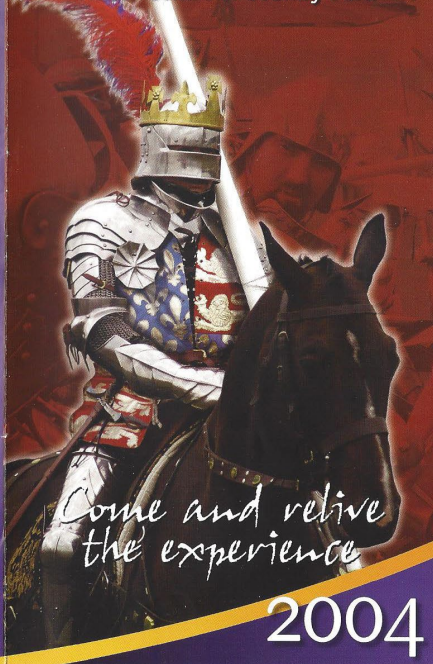
Fax: 01455 292841 Email: bosworth@leics.gov.uk

www.leics.gov.uk



Bosworth Battlefield

Visitor Centre & Country Park



Come and relive the experience

2004



A Warm Welcome

The Blue Boar Inn is one of the few remaining free-houses in England.

It combines the traditional atmosphere of an English country tavern, with fine, hearty food and excellent en-suite accommodation. It can provide the ideal stop-over for the business visitor, an informal, yet private meeting-place for a local club or group, a pillow for the weary traveller or simply a good, cask-conditioned pint.

**What's On: Thursday, 27th February 2003
Quiz night**

It's going to be a real battle of the brains at our quiz night. Up to the challenge? Teams of up to 4 people, sandwiches provided. £4.00 per person.

The Blue Boar Inn rests in the village of Temple Grafton close to Stratford-upon-Avon. Boasting over four centuries of innkeepers, this quintessential English hostelry combines a relaxed country atmosphere with professional customer care. This is not an impersonal hotel lobby or lonely motel room, this is a homely, friendly establishment which treats its guests as individuals.





That's it! Your booking is complete. Thank you for choosing to travel with Aer Arann.
Below you will find your travel itinerary and terms and conditions of travel. All times displayed are local.

Aer Arann is a ticketless airline ,therefore you will need to present your reference number at check in.
We suggest you **PRINT THIS PAGE AS A RECORD** of your booking and bring it with you to check-in.

Confirmation

Book date: 20 April 2004
Confirmation number: **B16VAB**
Status: **CONFIRMED** (see payment details)
You will need to provide this confirmation number at check-in to receive your boarding card.

Going Out

From Birmingham (BHX) to Cork (ORK) - V Fare
Sunday, 22 Aug 04 Flight 406 Depart Birmingham (BHX) at 19:45 and arrive in Cork (ORK) at 21:15

Passenger Details

CHRISTOPHER BRENNEN
360 OLIVE TREE LANE
SIERRA MADRE
UNITED STATES

brennen@its.caltech.edu

16263558038 (Tel)

Passenger Information

2 Passengers:
Adult 1: CHRISTOPHER BRENNEN
Adult 2: KATHARINE BRENNEN

Pricing

Total for 2 Passengers
Fare price £ 46.18 GBP
Taxes £ 25.80 GBP
GB Tranx Fee £ 3.00 GBP

Payment

Payment via Credit Card
Form of payment Visa
Payment Status **CONFIRMED**
Cardholder name Christopher Brenne

MR C BRENNEN
360 OLIVE TREE LANE
SIERRA MADRE
CALFIF
USA

22/08/04
1
23/08/04
1 16
VISA
0127844632 N011760001

Travelodge Cork (1)				
22/08/04	Accommodation	S	59.00	
	Room Rate			
22/08/04	Settlement Visa/Delta			59.00
	Invoice total in IEP	46.47		
	1 IEP = 1.269738 EUR			

VAT Code %	Goods/Svcs	VAT	Total
S @ 12.5	52.44	6.56	59.00
Grand Total	52.44	6.56	59.00



Close

From: ken@skelligtrips.com [SMTP:ken@skelligtrips.com]

To: Brennan, Chris

Cc:

Subject: Re: Boat trip reservation

Sent: 6/23/2004 4:58 AM

Importance: Normal

Dear Sir,

Sorry for not emailing you sooner. The Boat leaves from PORTMAGEE Pier, co. Kerry at 10:30 am in the morning.

The price is 35 Euro per person.

If you wish to go please call me the night before to check if the weather is ok for the trip as all trips are weather permitting.

Please call 087 1209924 for the weather conditions.

I am out of the country at the moment but i will be back on the 27th of June so I may be slow to Email you until but

I do confirm your booking for the 23 of August now

and again sorry for not emailing you sooner, I'm in Asia at the moment and hard to get to a PC here.

Many Thanks,

Kenneth Roddy/ Joe Roddy & Sons

Quoting "Brennen, Chris" <brennen@caltech.edu>:

> Ken:

>

> My wife and I would like to book a trip to Skellig Michael for Monday August

> 23. Can you confirm?

>

> Chris Brennan

> 360 Olive Tree Lane

> Sierra Madre

> California 91024

> USA

>

<https://exchsrvr.caltech.edu/exchange/forms/IPM/NOTE/read.asp?command=open&obj=0...> 6/24/2004



Boat to Skellig Michael



Skellig Michael



Skellig Michael



Skellig Michael



South Peak trail, Skellig Michael



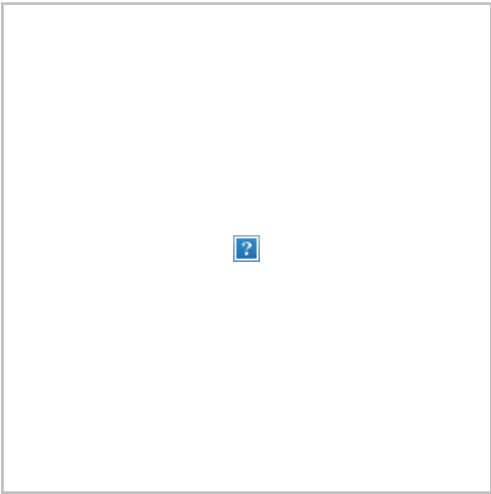
South Peak trail, Skellig Michael



On South Peak, Skellig Michael



On trail to monastery, Skellig Michael



The Monastery, Skellig Michael



At the Monastery, Skellig Michael



At the Monastery, Skellig Michael



At the Monastery, Skellig Michael



At the Monastery, Skellig Michael

The Scarriff Inn

with Ireland's most beautiful views



Telephone: 00353 66 9475132

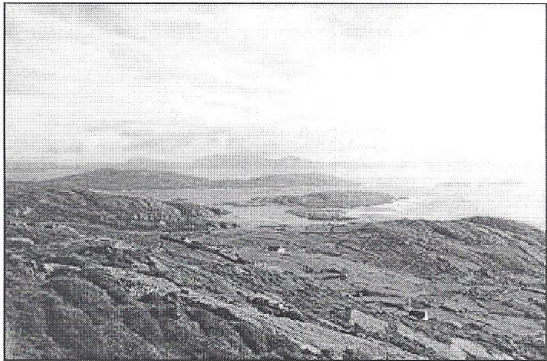
Caherdaniel - Ring of Kerry - Ireland

Email: 

Local Attractions

Make an Enquiry

The Scarriff Inn at Caherdaniel is a family run **Bed and Breakfast Inn** overlooking the best views in Ireland. From its bedrooms there are majestic views of Derrynane, Kenmare Bay and Bantry Bay. The Inn is halfway round the Ring of Kerry midway between Waterville and Sneem. All the rooms have sea views. Make an Enquiry



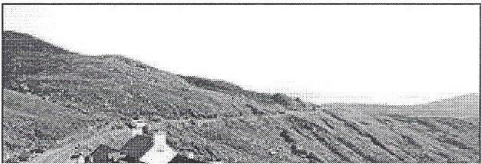
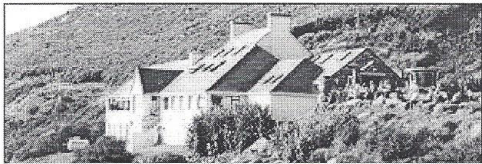
EURO RATES per Night per person sharing	
15 July - 30 August	€40 - €50
April - October	€30 - €40
10% discount on stays of longer than 2 days	

Make an Enquiry

Dine in the seafood restaurant and sample the outstanding cuisine as recommended by Sir Andrew Lloyd Webber or relax in the Visa bar and enjoy the scenery and ambience.



- 6 Bedrooms all with own facilities and shower
- All rooms with tea and coffee making facilities
- Direct dial telephones
- Golf trips arranged
- Diving and diving coaching arranged
- Sailing and other watersports locally
- Very peaceful location
- Sea fishing and freshwater fishing
- The Kerry Way for walking is close by
- Please enquire about pets, thankyou



Number: IE8A92651 F

**Hotels
Europe
Dunloe Castle
Ard na Sidhe**



Killarney Hotels Ltd., Killarney, Co. Kerry, Ireland.

Tel. (064) 71300
Fax (064) 32118

P!

Mr Christopher Brennen
360 Olive Tree Lane
Sierra Madre, CA

Room No. : 359
Arrival : 26.08.04
Departure : 27.08.04
Cashier : 9/BOS
Page : 1
Vch No. :

INVOICE 111338/1 Hotel Europe, Killarney, 27.08.04 10:15

Date	Description	Debit	Credit
26.08.	-Accommodation	153.00	
26.08.	-Brasserie	27.50	
	->#359 : CHECK #6802		
26.08.	-Brasserie	5.70	
	->#359 : CHECK #6802		
26.08.	-Brasserie	13.00	
	->#359 : CHECK #6802		
26.08.	Stamps	3.20	
27.08.	Visa Card		202.40
	->4024 004 6653 44160 06		

Balance 0.00F

TOTAL BILL 0.00F

Central Reservations Tel: 064 71350

HOTEL EUROPE
FOSSA, KILLARNEY, CO. KERRY, IRELAND
TEL.: 064-71300 FAX: 064-32118
E-mail: reception.europe@kih.liebherr.com
Web: http://www.iol.ie/kih/

HOTEL DUNLOE CASTLE
BEAUFORT, KILLARNEY, CO. KERRY, IRELAND
TEL: 064-44111 FAX 064-44583
E-mail: reception.dunloe@kih.liebherr.com
Web: http://www.iol.ie/kih/

HOTEL ARD NA SIDHE
CARAGH LAKE, KILLORGLIN, CO. KERRY, IRELAND
TEL: 066-9769105 FAX: 066-9769282
E-mail: reception.ardnasidhe@kih.liebherr.com
Web: http://www.iol.ie/kih/

It is our pleasure to have been of service and we look forward to your
BANK OF IRELAND, KILLARNEY, ACCOUNT No. 10001402. CITIBANK, CORK, ACCOUNT No. 8153019. V.A.T. No. IE 8A92651 F



The Dingle Bay Hotel
Strand Street, Dingle, Co. Kerry.
TEL. (066) 9151231 FAX. (066) 9152740
www.dinglebay-hotel.com
Email: info@thedinglebayhotel.com

Booking Receipt

Booking from 25/08/2004 to 26/08/2004
2 Adults and 0 Children
Rooms: 206 DB SMOK

Qty	Name	Sale Price	Sub-Total
1	Accom Centre	€123.50	€123.50
1	Bar Food 25/8/04	€27.50	€27.50
1	Bar Tip	€4.00	€4.00

Sub Total: €155.00
None: €0.00
:
Gratuity: €0.00
Total Payable: €155.00
Payments: €0.00

Balance Due: €155.00

Payment Method: Visa

Contact Details:
Brennan360 Olive Tree Lane, Sierra Madre, California, USA, , . ph:
0016263558038



Dingle Peninsula



Staigue Fort



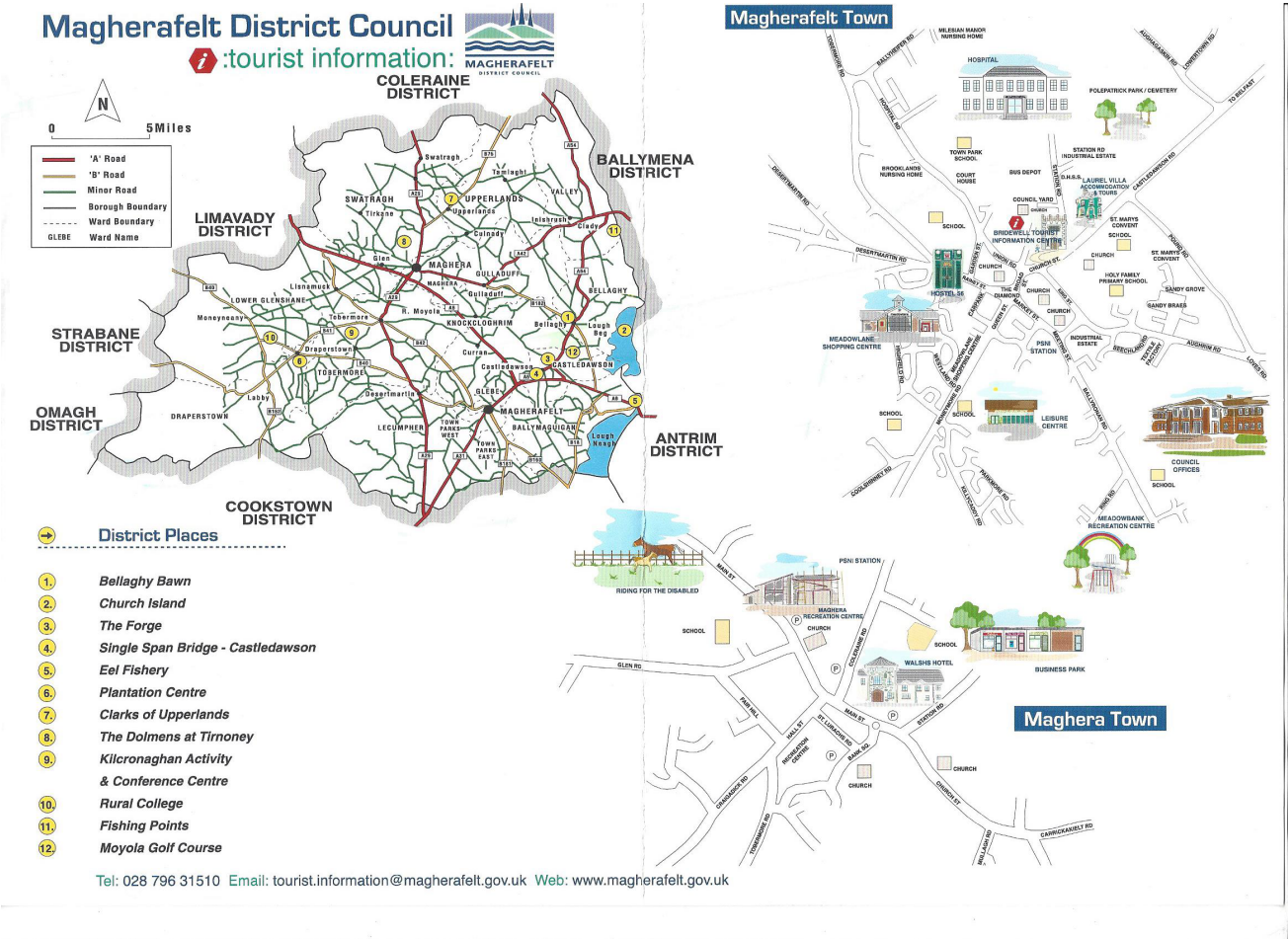
Killarney



Blarney Castle



Blarney Castle




THE TERRACE



hotel rates


mon - thurs	fri - sun
Single Occupancy £49.95	Single Occupancy £49.95
Double / Twin £35.00 pps	Double / Twin £40.00 pps
Triple £30.00 pps	Triple £35.00 pps
Family £40.00 pps	Family £45.00 pps
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The New World Centre for Saint Patrick is located beside Saint Patrick's Grave within the ancient town of Downpatrick, medieval capital of County Down. The Centre is just 30 minutes from Belfast in Saint Patrick's Country between the Mourne Mountains and Strangford Lough. It provides a great family day out and is an important destination for visitors interested in Saints, Scholars and the Early Christian Church.



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produced by flux graphics, (t) 028 4461 5613

Opening Times

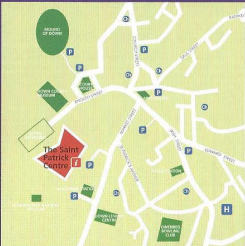
Low Season (October to March)	Mon - Sat	10.00 - 17.00
	Sunday	Open on request
Mid Season (April - May & Sept)	St Patrick's Day	09.30 - 19.00
	Mon - Sat	09.30 - 17.30
High Season (June - August)	Sunday (Morning Opening On Request)	13.00 - 17.30
	Mon - Sat	09.30 - 18.00
	Sunday	10.00 - 18.00

Please Note: Last admission to the exhibition is 1½ hrs before closing time.

Price List

Adults	£4.90
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The Saint Patrick Centre is ideally located in the North of Ireland, some 2 ½ hours from Dublin and 40 minutes from Belfast.

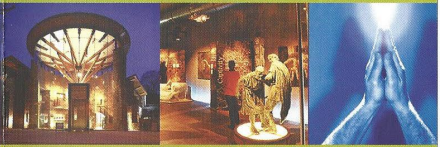


The Saint Patrick Centre acts as a gateway for visitors to explore the sites associated with Saint Patrick throughout Ireland.

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The Saint Patrick Centre



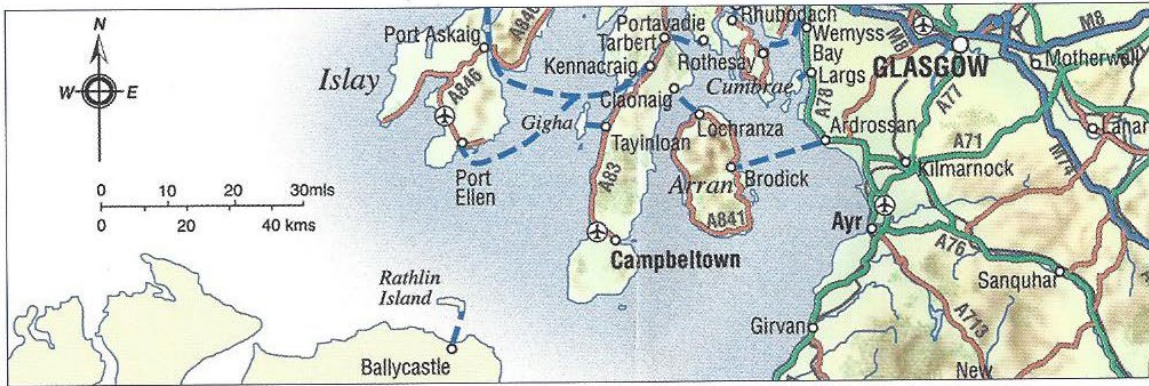
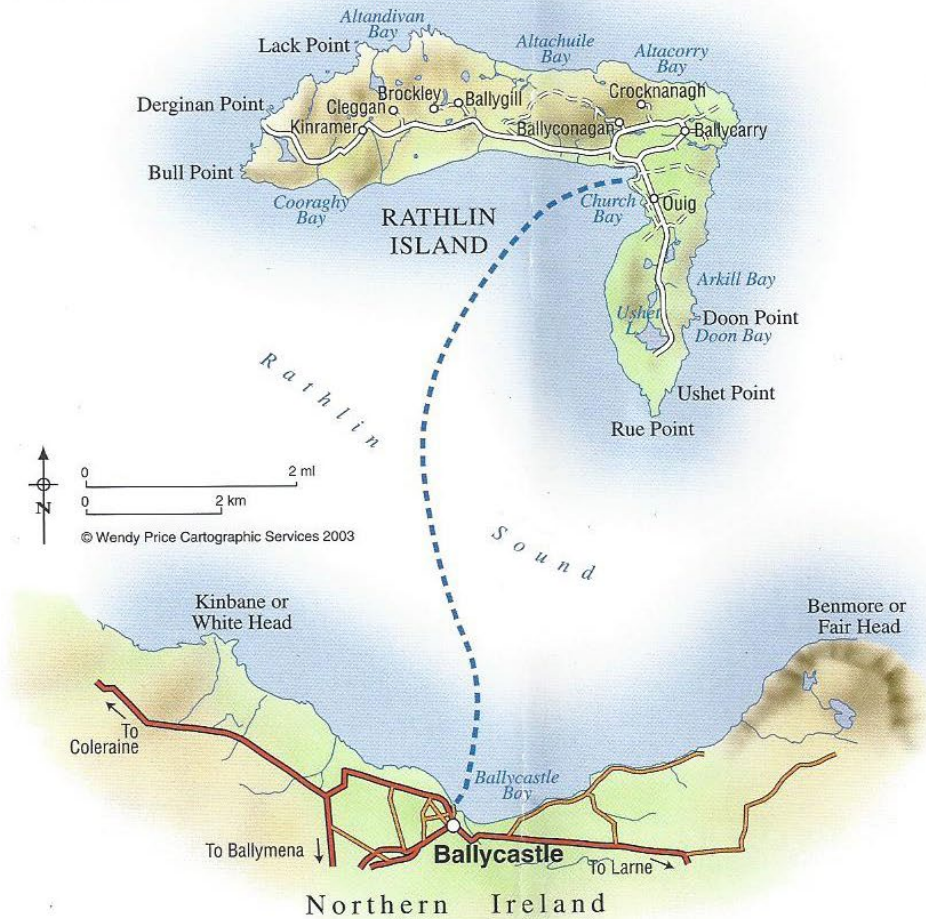
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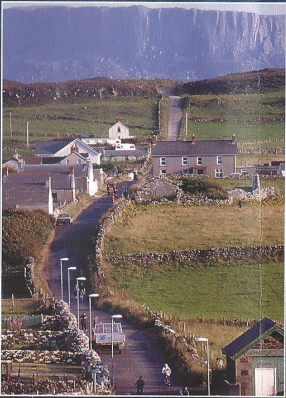
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Rathlin Island.

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The ferry to Rathlin Island travels just six miles across the "Sea Of Moyle". The Island is six miles long, one mile wide, "L" shaped and home to a small population of around seventy people.

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Rathlin has a wide range of natural beauty to visit, explore and enjoy.

In the harbour is the Boathouse, where visitors can discover some of the exciting history, learn about present day Island life and see some artefacts from shipwrecks around the Island. A short walk on around to Mill Bay there is a colony of seals, who are fun to just sit and watch.

At the other side of the Harbour are two churches, St. Thomas's (Church of Ireland) and St. Mary's (Roman Catholic) where visitors can sit quietly or just admire the architecture. At the West of the Island is the renowned R.S.P.B. bird view point, where Puffins, Guillemots, Razorbills, Kittiwakes can be viewed during the summer months. It is also home to some magnificent views, on clear days Donegal and the North Antrim coastline and the Island of Islay and Peninsula of Kintyre, Scotland can be seen.

Journeying down to the Rue Point, you pass Ushet Lough where the Islanders regularly hold model yacht races, down at the Rue Point there is another colony of seals and a clear view of Fairhead and the coastline towards Ballycastle Town.

Over at the East Lighthouse is the site of the most significant achievements in recent history. Marconi and his assistants, Kemp and Glanville, set up the World's first commercial radio transmission across the water from Rathlin to Ballycastle in 1898.

Throughout the year special occasions are celebrated with ceilidhs. Music, song and dance remain at the heart of community life.





Rathlin Island



Bruce's Cave, Rathlin Island



Bruce's Castle and West End, Rathlin Island



South End, Rathlin Island



Titanic Slip, Belfast

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*Last updated 7/30/99.
Christopher E. Brennan*

TRAVELS NOW AND THEN

© Christopher Earls Brennan

Slieve Gallion 2004

Slieve Gallion is the easternmost summit of the Sperrin Mountains in the western part of Northern Ireland. Rising to *1730ft* and only the 398th highest mountain in Ireland, it would rank as no more than a small pimple in most landscapes. But the broad flat summit, a blanket bog of wet heather and continual rainfall, is world's away from the green rolling farmland just *1500ft* below for, at this high latitude, the weather changes rapidly with elevation. On the southwest, the water runs off into a lovely mountain lake, Lough Fea by name. The crystal clear water has sustained people for thousands of years for, on a small hill in the townland of Ballybriest just *1/4* mile away, there are the remains of several neolithic long cairn graves. The views from there are superb in all directions, northeast to the barren summit of Slieve Gallion, southwest to Lough Fea and far off to the western horizon of the Sperrins. Only important chieftains could have warranted such an immortal view.



Slieve Gallion



Near-island in Lough Fea

Growing up in the village of Magherafelt just a few miles away, Slieve Gallion and Lough Fea represented the only real wilderness within the domain of my ramblings. My father loved to explore the narrow mountain roads that snaked up into the heather and around the lake. We would often take Sunday afternoon drives to places like Carndaisy Glen, a beautiful wooded glade on the slopes of Slieve Gallion. On a warm summer Sunday, a picnic might be planned for the glen or for the shores of Lough Fea itself. We especially liked the wooded near-island that jutted out from the south shore of the lough, a mound with a symmetry that suggested some ancient human shaping. I remember one Sunday in June 1952 when my youngest brother Colin, aged six, nearly drowned and my father dived deep into Lough Fea to recover and revive him. And every few winters, as in 1955, there would be a spell of weather cold enough that Lough Fea would freeze over and we would mount an ice skating expedition.

The year of 1958 marked my last as a Boy Scout for I had found many other diversions. However, before leaving, I had striven to complete one of the more advanced "badges" or awards that scouts could earn. One of the requirements for that badge was to undertake an overnight hike in a desolate area. The obvious choice was an adventure on Slieve Gallion. Peter Burton was a class mate and a fellow member of the local scout troop and he and I formed a plan for the overnight hike. We would hike the five miles from Magherafelt along the local roads to Carndaisy Glen where we knew of some grassy camping spots by the stream that ran through the glen. On our way to Carndaisy Glen, I recall that we may have cheated a little by accepting a ride on a tractor for several miles. In any case we pitched our tent by the stream in the glen and cooked some flapjacks (made from flour, butter and water, I think) on the hot rock beside our camp fire before turning in for the night.



Slieve Gallion

(Photo by Eugene Kielt)

In the morning, after breakfast, we set off up the lovely glen as it climbed onto the slopes of Slieve Gallion. I particularly remember the patches of iridescent bluebells. Perhaps it was they that caused me in the years that followed to associate flowers with Slieve Gallion. Indeed, when I took up oil painting many years later, my first effort was entitled "Flowers on the way to Slieve Gallion". Though it is of little artistic merit, I still keep that painting tucked away in a closet.

To return to the hike, we emerged from the top of the glen and transitioned onto the heather-covered moorland that covers most of the high ground on the mountain. Here the going got tougher for there were fewer tracks to follow and the heathland was mostly soggy underfoot. As we reached the broad

summit of the mountain, it began to rain and the day became quite miserable. We slogged our way across seemingly endless moorland, the rain having penetrated all of our clothing. Peter became quite dispirited and I can recall having to urge him on. It was my first experience of wilderness loneliness, my first sense of being at the mercy of nature. Not that I felt much fear for, even then, I had great confidence in both my physical endurance and in my navigational ability. It probably only took a few hours but after three miles of off-road travel we were back on established trails and descending the other side of the mountain. Once back onto those paved lanes, I regained confidence that we could complete the last four miles of the hike without having to call for assistance. Coincidentally, the sun came out and I recall sauntering down the mountain road with satisfaction in my accomplishment while also revelling in the beauty of the drying countryside. We completed the hike by road through Desertmartin and back to Magherafelt with plenty of daylight to spare. That adventure was my first real challenge in the outdoors and one whose success stayed with me the rest of my life. It also created a special affection within me for Slieve Gallion, the mountain that would witness other moments of joy and sadness during my life.

Corporal Albert Symonds was killed on July 15, 1944, at the fierce battle for Caen, just after the Normandy landings in France that began the end of the Second World War. He was just 26 and left behind a wife and very young daughter, Laverne, just over a year old. Laverne grew up in a small market town in the shadow of Slieve Gallion, a place called Cookstown. She was raised by her mother, Gertrude Symonds, and her grandmother who were very protective of her welfare. They lived in a terrace house on the west side of Oldtown Street in Cookstown and, when she was old enough, Laverne attended the Rainey Endowed School in Magherafelt. There, in the autumn of 1958, I first became aware of this skinny girl with the sultry smile. I was infatuated by her languid sexuality and in a few months we became high school sweethearts. She was the only woman with whom I had a significant relationship before I met my wife and that was several years later, after I had left high school. Laverne and I had a mercuric relationship, sometimes on, sometimes off. It seemed to me that she no sooner had me in tow than she would become interested in another boy. But we shared many special moments whose memory could not but stay with me down through the years. I remember one spring afternoon, March 22, 1959, when we drove to Lough Fea and walked and talked along the lakeshore and among the neolithic gravestones. A year later, at Easter 1960, we visited London together where she stayed with relations in High Barnet and I roomed in the YMCA in central London. However, in the summer of that year, our two year relationship came to an end for, in July 1960, I met and fell in love with Doreen.



Ballybriest neolithic cairn

In 1961 Laverne entered Queens University, Belfast where she became the second woman in the history of that university to earn a Civil Engineering degree. I think the last time I saw her was in 1962 when

Doreen and I encountered her briefly while walking along University Street on the Belfast campus. After graduation she took an administrative job in a university library. In Belfast, she met and married David Haskins, a teacher, and they had a son, Michael. After Michael's birth Laverne suffered severe post-partum depression and never returned to work; David believes she never fully recovered. She and David were separated and Laverne lived the rest of her life in Lisburn with Michael while David moved to a terraced house in Belfast. Michael became a musician, a guitarist with a group called Maya.

But I knew little of what had become of her after graduation. There were many moments when I thought to make contact with her out of curiosity more than anything else. But I could never quite justify such a contact as long as there was even the remotest possibility that Doreen might be hurt. Finally, however, in the year 2004, while visiting Northern Ireland, I acquired David Haskins' telephone number and called him to enquire as to how I might get in touch with Laverne. He informed me that Laverne had died of ovarian cancer on July 11, 2004, just a month earlier. After more than 40 years, I had reached back a month too late.

Her son and her mother were with her when she died. She was cremated on July 15, the date on which her father had been killed. Several days later, in accord with her wishes, her ashes were scattered to the winds at the Ballybriest neolithic cairn overlooking Lough Fea. A month later I stood alone in the rain and placed flowers on those ancient stones. Flowers on the way to Slieve Gallion.

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Last updated 7/30/99.

Christopher E. Brennan

CALIFORNIA INSTITUTE OF TECHNOLOGY

DIVISION OF ENGINEERING AND APPLIED SCIENCE

Mail Code 104-44

Pasadena, California 91125

626-395-4117

FAX: 626-568-2719

Sep.10, 2004

Dear Barbara,

Doreen and I just returned from an extended visit to Magherafelt and I was reminded of you when I shopped in the clothing store that now occupies 'your ground floor'. Finding your address on the internet, I realized that I would be near Guilford on the evening of Friday, October 22, during a trip to the east coast. It would be lovely to see you (and Collin) again for a chat about old times. Any chance of getting together for coffee or dinner that evening?

Hoping this is not awkward for you,

Christopher E. Brennen
Professor of Mechanical Engineering
(brennen@its.caltech.edu)

10/21/04	UA	192	LAX	IAD	T, BP
10/21/04	UA	8089	IAD	PVD	T, BP

It is my speculation many years later that I spent the day of 10/22 consulting with Electric Boat in Groton, CT. And that I had dinner with Barbara in Guilford on the evening of 10/22.

10/23/04	UA	1923	PVD	PHL	T, BP
10/25/04	UA	95	PHL	LAX	T, BP

[NYTimes.com](#) > [Education](#)

When These Friends Get Together, the Talk Is Rarely Small

By JOHN M. BRODER

Published: March 7, 2004




PASADENA, Calif. — Every weekday at noon, a group of eminent scientists gathers for lunch at a round table in the middle of the dining room of the Athenaeum, the slightly musty faculty club at the California Institute of Technology.

The group often includes two or three Nobel laureates among the four currently on the Cal Tech faculty. The professors are occasionally joined by Cal Tech's president, Dr. David Baltimore, who won a Nobel Prize in 1975 for his work in virology.


On any given day, the table might be, to paraphrase John F. Kennedy, one of the most extraordinary collections of scientific talent ever gathered together, with the possible exception of when Einstein dined alone. (Which he may

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well have done when he lodged in the Athenaeum during a two-month stay on the Cal Tech campus in 1931.)

The discussions range widely, from the latest advances in particle physics to the freshest campus gossip. When Richard Feynman, the brilliant theoretical physicist who died in 1988, participated in the lunches, fellow faculty members and graduate students hovered around the table hoping to snare one of his place-mat doodles as a souvenir.

The Cal Tech discussions could be compared to the celebrated Round Table at the Algonquin Hotel in New York, where leading literary wits of the 1920's traded quips and well-crafted insults.

But the round table at the Athenaeum is a more sober and discursive affair. The discussions are notable for their spirit of inquiry, lack of intellectual pretension and absence of verbal one-upmanship.

On a recent Thursday, Dr. Baltimore joined seven senior faculty members around the table for a lunch of salads and light sandwiches. They drank nothing stronger than iced tea and lemonade.

The participants ranged in age from 49 to 90 and among them had hundreds of years of scientific expertise. They wore thick-soled shoes and tweed sport coats and sweaters that were probably older than most of their students.

Much of the discussion centered on the Rover expedition to Mars, run from the Jet Propulsion Laboratory, which Cal Tech operates in conjunction with the National Aeronautics and Space Administration.

"Supposing they find water; does this change the whole picture of life in the solar system?" asked Francis Clauser,



House of the day

Outer Banks, NC

This soundfront executive home, in a gated community on Ballast Point includes an elevator and a game room.

[View](#) this and many other homes in the Outer Banks on realestate.nytimes.com.

a 90-year-old emeritus professor of engineering and aeronautics and an amateur yacht designer.

Dr. Baltimore, 65, whose biological research has led to significant advances in cancer and AIDS treatment, replied: "There is no certainty that the existence of water means the existence of life. The other way around is probably true, though."

The curious Dr. Clauser inquired, "Would you expect to find fossils of some kind?"

"That's a lot to ask," Dr. Baltimore replied. The conversation then turned to fossil formation and lipid envelopes of various thicknesses, way beyond the ken of a fly-on-the-wall newspaperman.

Scott Fraser, a professor of biology and at 49 the youngest member of the group, piped up with a provocative question about the interplanetary travel of early life forms.

"What is the possibility that life on Earth started on Mars and was seeded here from asteroids?" he asked.

"Conditions for evolution of life on Mars may have been better than on Earth at one time," Dr. Baltimore said.

"That's still pretty speculative," interjected Prof. Christopher Brennen, 62, an Irish-born mechanical engineer and an expert on cavitation and bubble dynamics.

"If they find life on Mars, it's sure going to stir up the religious community," Dr. Clauser said.

The conversation then turned to more earthbound concerns — the conflicts in Northern Ireland and the Middle East, Iraq and Afghanistan. Prof. Jack Richards, a

73-year-old biochemist, noted that Dr. Clauser had traversed "nearly every square foot of the planet, most of it in a Volkswagen." Dr. Clauser drove over the Khyber Pass into Afghanistan when the Russians still occupied the country and he was in his 70's.

"I thought I was crazy," Dr. Brennen, an avid mountain climber, said under his breath.

The discussion then took a detour through the landscape of American politics, an area where the professors had decidedly less expertise than they did in fluid dynamics and molecular biology. The conversation could have been overheard in any hotel bar or student lounge.

"Is Bush going to hold on to Cheney?" asked Robert Christy, 87, a leading researcher on the Manhattan Project and an emeritus professor of theoretical physics.

"Bush is going to need a scapegoat," Professor Brennen said.

Dr. Richards chimed in. "I think Kerry-Edwards is a very formidable ticket," he said.

Talk then circled back around to the American space program, and to President Bush's recent announcement of a new round of manned planetary exploration. The professors were skeptical.

Professor Fraser noted that the Mars expeditions had already produced huge scientific gains without risking human life or the expenditure of the hundreds of billions of dollars required for the safety systems needed for manned space excursions.

"Here they have amazing success with unmanned programs and all they want to talk about is manned

missions," he said. "When you compare the bang for the buck you get with unmanned programs. . . . "

"I think part of it is based on the prospect of the Chinese landing on the moon," Dr. Brennen said. "I think there's political pressure behind this."

Nelson Leonard, 87, a faculty associate in organic chemistry, said he had seen a number of undergraduate applicants to Cal Tech who said they hoped to travel to Mars someday.

The adventurous Dr. Brennen said that he would go to Mars. He was asked if he would go if he knew he could not come back.

"I still want to go," said Professor Brennen, the mountaineer. "The highest mountains in the solar system are on Mars."

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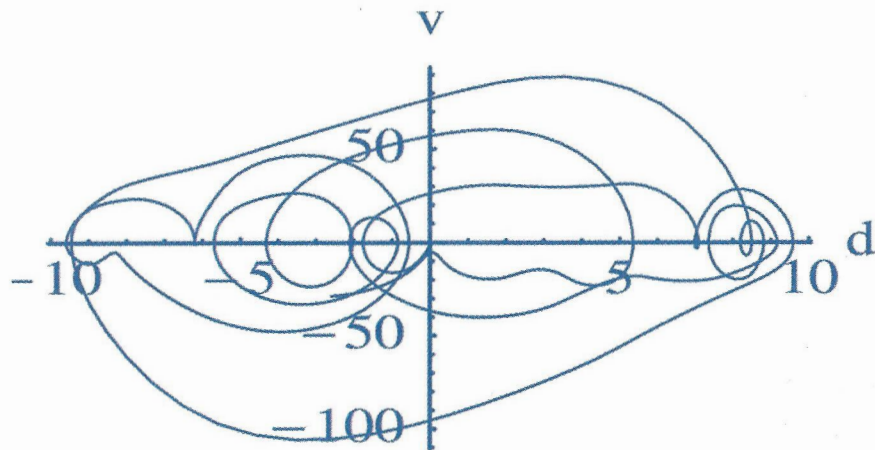


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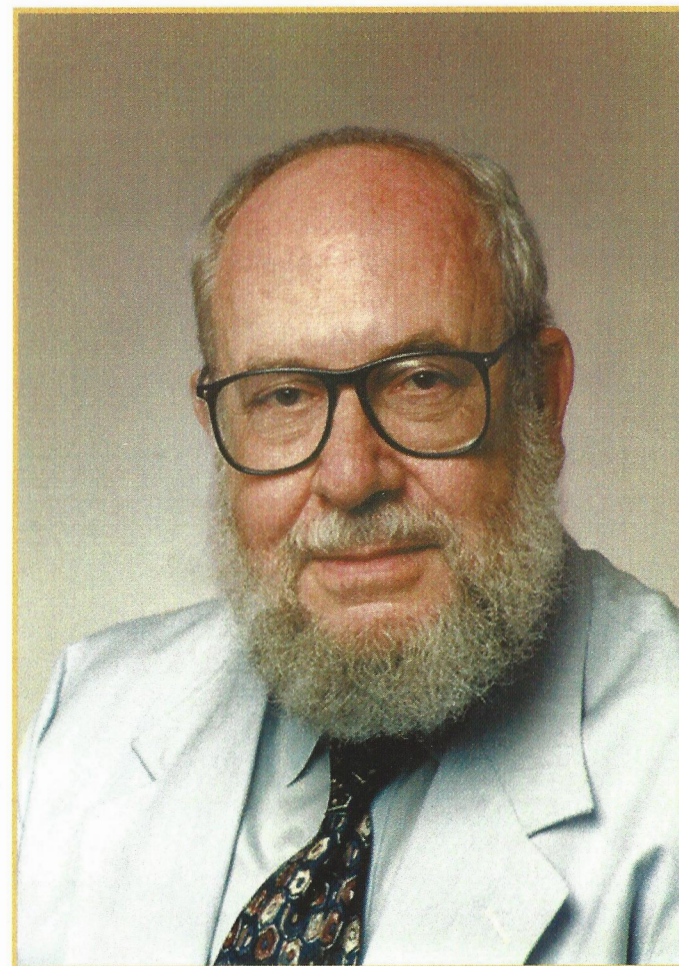
Phase diagram for a noisy nonlinear oscillator under random excitation.



IN MEMORY OF

Thomas K. Caughey

Richard L. and Dorothy M. Hayman Professor of Mechanical Engineering, Emeritus
1927–2004



PROGRAM

4:00–4:15

Welcome, James K. Knowles

4:15–5:30

Individual Speakers

5:30–6:00

Reception



Professor Thomas K. Caughey was an international leader in the field of dynamics and vibrations, particularly in the responses of nonlinear systems and randomly excited systems. Additionally, he did important work with Caltech colleagues on fluid-induced forces in turbomachinery. In recent years he had become involved in the areas of structural monitoring and active control of large structures, such as buildings and bridges, when subjected to earthquakes or strong winds. His work was noted for its elegant style and mathematical rigor. His several awards include the Alfred M. Freudenthal and Theodore von Kármán medals from the American Society of Civil Engineers and the J. P. Den Hartog Award of the American Society of Mechanical Engineers.

—Professor Paul C. Jennings

HOST

James K. Knowles

William R. Kenan, Jr., Professor and Professor of Applied
Mechanics, Emeritus, Caltech

SPEAKERS

Allan J. Acosta

Richard L. and Dorothy M. Hayman Professor of Mechanical
Engineering, Emeritus, Caltech

Christopher E. Brennen

Professor of Mechanical Engineering,
Caltech

Stephen H. Crandall

Ford Professor of Engineering, Emeritus,
Massachusetts Institute of Technology

Phyllis Hudson

Board of Directors, Program Committee Chair,
Coleman Chamber Music Association

Paul C. Jennings

Provost and Professor of Civil Engineering and Applied
Mechanics, Caltech

Sami F. Masri

Professor of Civil/Environmental Engineering and Aerospace and
Mechanical Engineering, University of Southern California

Per G. Reinhall

Professor, Mechanical Engineering,
University of Washington

TEACHING QUESTIONNAIRE

3rd

Instructor Name: Brennan

Course No.: Mc 101 ^{2nd} Term 2003/04

You are a: ☐ Freshman ☐ Sophomore ☐ Junior ☐ Senior ☒ Graduate Student

You are being asked to provide your opinion regarding the effectiveness of your instructor in the attitudes or behaviors listed below. You may supplement this anonymous questionnaire with a formal signed letter to the Chairman of the Division of Engineering and Applied Science. Return this form in a sealed envelope to Sallie Manson, EAS Division Office, 104-44.

A= Excellent B= Above Average C= Average D= Below Average E= Far Below Average
NA= Not Applicable or No Opportunity to Observe

This instructor:

- | | | | | | | |
|--|----------|---|---|---|---|----|
| 1. Has command of the subject. | <u>A</u> | B | C | D | E | NA |
| 2. Was well prepared for class and gave presentations which were organized and clear. | <u>A</u> | B | C | D | E | NA |
| 3. Was responsive to the class, e.g., welcomed questions and discussion as class size and other circumstances permitted. | <u>A</u> | B | C | D | E | NA |
| 4. Made course requirements and course grading criteria clear. | <u>A</u> | B | C | D | E | NA |
| 5. Are the number of units of this course reasonable? | <u>A</u> | B | C | D | E | NA |
| 6. Returned tests, papers and assignments in a reasonable time period. | <u>A</u> | B | C | D | E | NA |
| 7. Instructors' availability outside of class. | <u>A</u> | B | C | D | E | NA |
| 8. How useful was the homework. | <u>A</u> | B | C | D | E | NA |
| 9. The probability that I would recommend this instructor to another student is: | <u>A</u> | B | C | D | E | NA |

For laboratory courses:

- | | | | | | | |
|--|---|---|---|---|---|----|
| 10. Experiments were informative and challenging. | A | B | C | D | E | NA |
| 11. Lab materials were available and equipment was in good repair. | A | B | C | D | E | NA |

Comments:

Great Class. I feel honored to have attended.

Comments:

Prof. Brennan's class was excellent ; my best ever,

Comments:

The class was both well-structured and informative.

Comments:

Great class = Great instructor.

Comments:

One of the best instructors i've had for sure. Thanks for a very good course!

I especially appreciate Dr. Brenneke's "physical" ^(over) approach to the material i.e. trying to deliver

Comments:

One of my 2 favorite courses @ Caltech. Homework was interesting, ~~but~~ not unreasonably hard. Lectures were all understandable and mostly interesting (sometimes derivations got long, but you can't avoid that usually). Thanks for an awesome class.

(over)

Comments:

I've never given any instructor all A's before.
He is pretty exceptional.

(over)

TEACHING QUESTIONNAIREInstructor Name: BrennenCourse No.: ME101 1st Term 2003/04You are a: ☐ Freshman ☐ Sophomore ☐ Junior ☐ Senior ☒ Graduate Student

You are being asked to provide your opinion regarding the effectiveness of your instructor in the attitudes or behaviors listed below. You may supplement this anonymous questionnaire with a formal signed letter to the Chairman of the Division of Engineering and Applied Science. Return this form in a sealed envelope to Sallie Manson, EAS Division Office, 104-44.

A= Excellent B= Above Average C= Average D= Below Average E= Far Below Average
 NA= Not Applicable or No Opportunity to Observe

This instructor:

- | | | | | | | |
|--|-----|---|-----|---|---|----|
| 1. Has command of the subject. | (A) | B | C | D | E | NA |
| 2. Was well prepared for class and gave presentations which were organized and clear. | (A) | B | C | D | E | NA |
| 3. Was responsive to the class, e.g., welcomed questions and discussion as class size and other circumstances permitted. | (A) | B | C | D | E | NA |
| 4. Made course requirements and course grading criteria clear. | (A) | B | C | D | E | NA |
| 5. Are the number of units of this course reasonable? | A | B | (C) | D | E | NA |
| 6. Returned tests, papers and assignments in a reasonable time period. | (A) | B | C | D | E | NA |
| 7. Instructors' availability outside of class. | (A) | B | C | D | E | NA |
| 8. How useful was the homework. | (A) | B | C | D | E | NA |
| 9. The probability that I would recommend this instructor to another student is: | (A) | B | C | D | E | NA |

For laboratory courses:

- | | | | | | | |
|--|---|---|---|---|---|----|
| 10. Experiments were informative and challenging. | A | B | C | D | E | NA |
| 11. Lab materials were available and equipment was in good repair. | A | B | C | D | E | NA |

Comments:

Chris is an excellent instructor.

The programming assignments took a long time.

Comments:

I think Prof Brennan is the best professor I have had so far at Caltech - and I have no complaints about the class at all.

Comments:

Great organization and presentation of material. I have learned a great deal

Comments:

Prof. Brennan is an Excellent teacher. He makes things very clear.

Comments:

Dr. Brennan does an excellent job of making the connection between the mathematical description and the physical phenomena under discussion. Dr. Brennan clearly takes teaching very seriously and prepares well for class. Dr. Brennan is also very solicitous and responsive to student input. (over)

Comments:

Unquestionably my favorite class this quarter - and it's not even in my option. Might be made even better with more emphasis on the fluid physics, less on strictly engineering problems.

Comments:

Prof. Brennan is a wonderful teacher. Besides developing a rapport with the class he gives exceptionally clear lectures. Very engaging. Can't say enough good things about him.

(over)

TEACHING QUESTIONNAIREInstructor Name: BRENNEMCourse No.: Ae10/b 2nd Term 2003/04You are a: ☐ Freshman ☐ Sophomore ☐ Junior ☒ Senior ☐ Graduate Student

You are being asked to provide your opinion regarding the effectiveness of your instructor in the attitudes or behaviors listed below. You may supplement this anonymous questionnaire with a formal signed letter to the Chairman of the Division of Engineering and Applied Science. Return this form in a sealed envelope to Sallie Manson, EAS Division Office, 104-44.

A= Excellent B= Above Average C= Average D= Below Average E= Far Below Average
NA= Not Applicable or No Opportunity to Observe

This instructor:

- | | | | | | | |
|--|-----|---|---|---|---|----|
| 1. Has command of the subject. | (A) | B | C | D | E | NA |
| 2. Was well prepared for class and gave presentations which were organized and clear. | (A) | B | C | D | E | NA |
| 3. Was responsive to the class, e.g., welcomed questions and discussion as class size and other circumstances permitted. | (A) | B | C | D | E | NA |
| 4. Made course requirements and course grading criteria clear. | (A) | B | C | D | E | NA |
| 5. Are the number of units of this course reasonable? | (A) | B | C | D | E | NA |
| 6. Returned tests, papers and assignments in a reasonable time period. | (A) | B | C | D | E | NA |
| 7. Instructors' availability outside of class. | (A) | B | C | D | E | NA |
| 8. How useful was the homework. | (A) | B | C | D | E | NA |
| 9. The probability that I would recommend this instructor to another student is: | (A) | B | C | D | E | NA |

For laboratory courses:

- | | | | | | | |
|--|---|---|---|---|---|------|
| 10. Experiments were informative and challenging. | A | B | C | D | E | (NA) |
| 11. Lab materials were available and equipment was in good repair. | A | B | C | D | E | (NA) |

Comments:

Prof. Brenner is wonderful!

Comments:

Despite the fact we went over difficult material at a fairly quick rate, the lectures explained it well; the homework was interesting and meaningful.

Comments:


Chris is the best professor at Caltech! He made me love fluid mechanics.

Comments:

Dr. Brennen is one of the best instructors I have come across. He is exceptionally good & gives a lot of insight into subtle issues.

(over)

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Singing sand

Caltech professors seek cause of phenomenon at dunes

02:43 AM PDT on Saturday, September 25, 2004

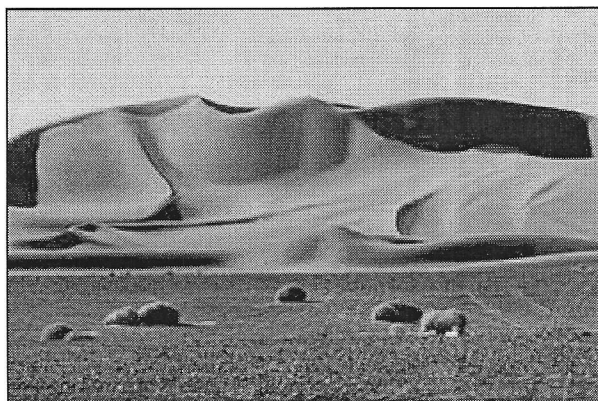
By JENNIFER BOWLES / The Press-Enterprise

In the remote, northern reaches of the San Bernardino County desert, Melany Hunt and Christopher Brennen are standing on top of a towering sand dune, hoping their next move will help unravel a centuries-old mystery.

The Caltech professors, along with two graduate students, plop down on the spiny crest of the dunes, count to three and push off. Using their hands and feet, they propel themselves to slide down the 350-foot velvety cream slope on their behinds.

At first, the gusty wind prevents them from hearing what they traveled some 200 miles to study on a sun-drenched morning this week: how the dunes sing.

"You can barely hear it," said Hunt, speaking between gasps as she makes her way back up the soft, steep dunes, sliding back with every step forward. "Usually, it booms."



William Wilson Lewis III / The Press-Enterprise

When sand on the surface of a dune is disturbed, scientists say the friction between grains creates a noise that reverberates. A Caltech team Friday was

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Scientists have wondered for years why the dunes make sounds and under what conditions. Others have tinkered with the mystery and come up with speculative explanations, Brennen said, but no one has taken a close look until now.

attempting to measure the sound waves at the Dumont Dunes in San Bernardino County.

"The tribes in the Saharan desert used to think the gods were speaking to them," said Brennen, 62.

"Like a violin string," he explained, "there's a layer of loose sand on the face of the dunes and it resonates. It's quite eerie and quite bizarre and that's the intriguing thing - its otherworldly noise."

The Caltech team, made up of mechanical engineers and geologists, has traveled across the West to test dunes in Utah, Nevada, Colorado and elsewhere in California.

But Dumont Dunes north of Baker is the closest location to the team's Pasadena campus with the right ingredients: steepness and height - at least 150 to 200 feet tall.

Blustery Day

The Santa Ana winds are blowing so hard they whip up the fine grains of sand, making it difficult even to stand on the luminescent dunes just outside Death Valley National Park.

The scientists are worried that the winds, surging in the opposite direction of the usual northerly winds, have changed the dynamic of the dunes.

In the meantime, they turn to other tests. Using their body weight and a hammer, they push and twist a thin probe into the dunes at different intervals - three feet, four feet, six feet - where a tiny claw snatches samples of the sand below.

"We didn't get much of a sample," Hunt said as she funneled the sand into a jar, "but it looks pretty wet."

The jars will be taken back to the lab and the sand analyzed for its dampness. The researchers want to determine the depth of the hardened layer below, Brennen said.

When the sand on the surface is disturbed, they believe, the friction between the grains creates a noise that reverberates between the hard and soft surfaces.

"We need to know how much water is needed to achieve that acoustic property," Brennen said.

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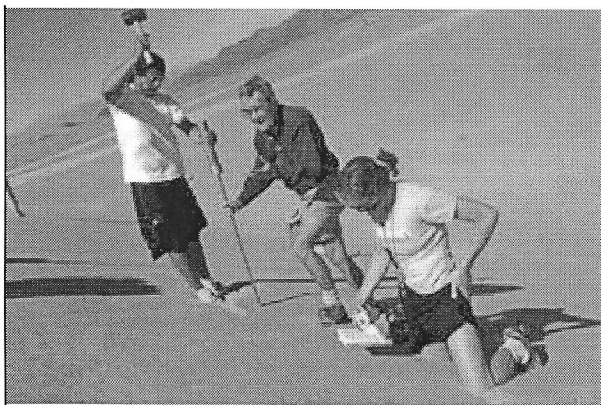
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Angel Ruiz hammers while Christopher Brennen holds a device to extract a sample of sand. "Slowly, every time we go out, we learn a little bit more," says Melany Hunt, right, who reviews her notes.

Unlocking a Phenomenon

Hunt agrees the testing of the dunes is a little offbeat, but says its mystery is alluring.

"Slowly, every time we go out, we learn a little bit more," she said. She first got the bug to test the dunes when shaking a jar of sand students had brought back to campus from some dunes.

"Even on this small scale," she said. "you get this kind of funny sound that you don't find other places, so that was intriguing."

So, Hunt and Brennen went about their quest to understand why the sounds erupt from some dunes, either naturally or induced by walking or sliding, but not from others.

"And then what's really interesting about the sound, it's this really pure frequency," Hunt said. "It's really a very clear tone you'd associate with a musical instrument."

"The question is what sets up that tone, that frequency, and what parameters lead to giving you a clean sound."

The mechanics behind granular flows are much more complicated than the flows of air and water, Brennen said.

A better understanding of the way granular material moves, he says, can lead to advances in industrial uses and a better understanding of how to prevent the kind of deadly mudslides that happened last Christmas on a fire-scarred slope in the San Bernardino Mountains.

"If we can understand the way granules flow," Brennen said, "it can help engineers design better culverts to minimize those flows."

Another Slide

As the wind dies down, the group tries sliding again. Angel Ruiz, a graduate student from Mexico City, quickly sticks geophones, similar to microphones, into the dunes to pick up any vibration and record the sound.

As group members move in tandem down the slope, a droning sound, much like a military jet flying low overhead, reverberates through the dunes, echoing long after they've stopped.

"At least it wasn't a complete disaster," Hunt said, after climbing back up the dunes, this time with arms outstretched so her hands can help her climb.

"I think they're fascinating," she said, glancing at the dunes, "just the shapes that they take."

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Singing sand

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STUDY: FINDINGS COULD LEAD TO PREVENTION OF DEADLY MUDSLIDES



WILLIAM WILSON LEWIS III/THE PRESS-ENTERPRISE

When sand on the surface of a dune is disturbed, scientists say the friction between grains creates a noise that reverberates. A Caltech team Friday was attempting to measure the sound waves at the Dumont Dunes in San Bernardino County.

SINGING SAND

Caltech professors seek cause of phenomenon at dunes

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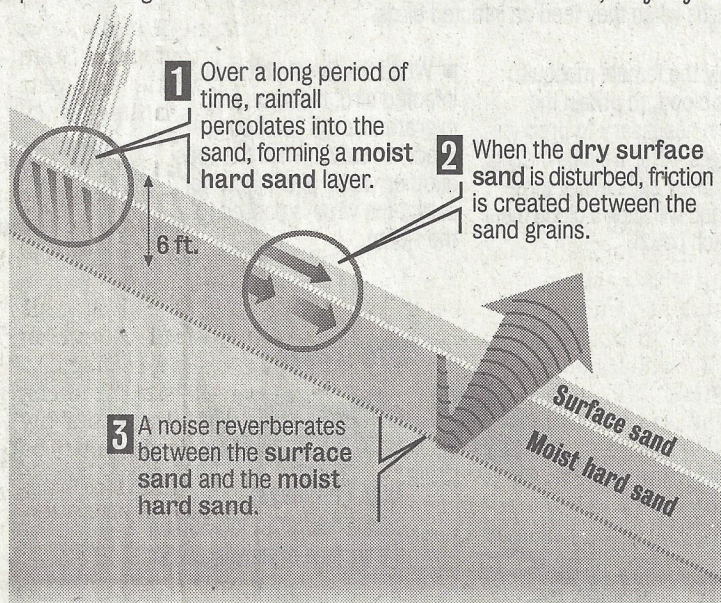
Scientists from Caltech in Pasadena, testing for an unusual sound they believe is created by friction, slide down a sand dune in the desert north of Baker.

At first, the gusty wind prevents them from hearing what they traveled some 200 miles to study on a sun-drenched morning this week: how the dunes sing.

"You can barely hear it," said Hunt, speaking between gasps as she makes her way back up the soft, steep dunes, sliding back with every step forward. "Usually, it booms."

Scientists have wondered for years why the dunes make sounds and under what conditions. Others have tinkered with the mystery and come up with speculative explanations, Brennen said, See **DUNES/B9**

MOVING SAND: Caltech scientists are trying to figure out why sand particles sing on sand dunes. It has a lot to do with friction, they say.



SOURCE: CALTECH

THE PRESS-ENTERPRISE

DUNES

CONTINUED FROM B1

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CHRISTOPHER BRENNEN

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WILLIAM WILSON LEWIS III/THE PRESS-ENTERPRISE

On Friday, Angel Ruiz, left, pounds a device into the sand that will extract samples as Christopher Brennan, center, assists and Melany Hunt reviews her notes. The scientists are measuring sound waves.

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Reach Jennifer Bowles at (951) 368-9548 or jbowles@pe.com



Melany Hunt says she first heard the alluring sound of the dunes from a jar of sand that students had brought back. "That was intriguing."



DESERT SONGS: *Dune-tune enthusiasts who take a ride down the right sand dune at the right time may hear it boom, burp or bark.*

RYAN PETERSON For The Times

Burp or a bark?

Caltech scientists hit the sand to discover why some dunes sing.

By JOEL GROSSMAN
Special to The Times

SOME desert sand dunes boom, burp and bark when people slide down them and others never make a sound. Figuring out which dunes make noise, especially in the fall, and why, is a tradition bordering on obsession at Caltech in Pasadena.

"It's not a quick boom; it's more like a rumble that goes on for at least 60 seconds," said Kathy Brantley, who wrote her thesis on tuneful dunes after participating in Caltech's Summer Undergraduate Research Fellowship, SURF, program. She brought to her studies a few important assets: an interest in the physics of ice floes and avalanches, and skiing experience which taught her the essential hand-butt coordination required to slide down the dunes and get their rumbles flowing. The sounds last, Brantley said, as long as a rider slides — and sometimes for up to a minute more.

The Southern California researchers are amassing data on a long-recorded phenomenon. The ancient Chinese called rumbling sand hills *ming-sha-shan*. Marco Polo and other medieval desert rats, whose tales were often dismissed as desert delirium, were not hallucinating when they reported sounds resembling kettledrums north of Kabul, Afghanistan, and in the Gobi Desert.

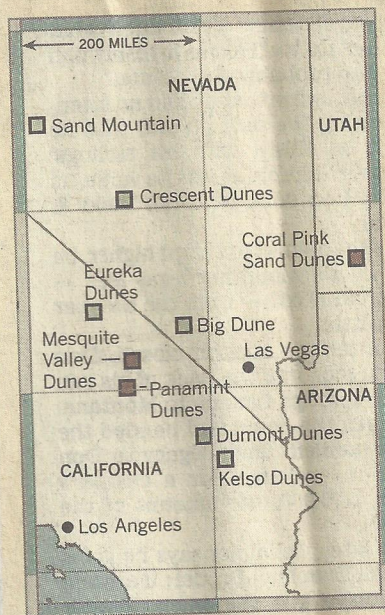
In his 1941 book "The Physics of Blown Sand and Desert Dunes," British investigator R.A. Bagnold described the vibes as "the song of sirens who lure travelers to a waterless doom, the tolling of underground bells in sand engulfed

SNAPSHOT

Sound effects

Caltech researchers use geophones buried in the sand to determine which desert dunes boom or burp.

□ Booming dunes
■ Burping dunes



Source: Caltech

Los Angeles Times

monasteries." Studies by Bagnold and others have shown that sand of an appropriate grain size and smoothness emanates sound when put into motion. In some instances, its vibrations can be felt through the body. Beach sands, in contrast, meekly squeak when walked upon.

Caltech mechanical engineering professor Melany Hunt is picking up on the work of engineer Bob Sharp, who began the first of 50 trips to Kelso Dunes in the Mojave National Preserve in the 1950s. Hunt said the knowledge gleaned from sand flows will yield insights into the physics of other flows, including Los Angeles' destructive hill slides.

She leads students to the sweltering Kelso area, as well as to Dumont Dunes near Baker, Eureka Dunes in Death Valley National Park and Big Dune in Beatty, Nev. They bury microphones called geophones in the sand, then, using a computer sound card back in the air-conditioned lab, play back their vibes.

But there is more to coaxing out dune tunes than good hand-butt coordination. Like surfers eyeing waves, dune-tune enthusiasts must ride the right dune at the right time.

They have learned that dry sand is more musical than moist, and that dune tunes are louder in the fall than in the spring. Small, young, shiftless dunes usually keep quiet while older dunes more than 200 feet high produce a wide range of sound.

The Caltech crew uses the burp test to audition dune sand for musical potential. Some technique is involved, but they can detect a noisemaker by gently shaking a jarful of dry sand collected from near the top. No burp? A silent dune.