

*Galtonia candicans*

# The Galton Institute

## NEWSLETTER

Issue Number 84

Summer 2015

### EDITORIAL

As this is my first issue as editor, I should like to start by paying tribute to my predecessor, Dr. Geoffrey Vevers, whose diligence and perseverance meant that every newsletter was honed to perfection.

These are exciting times for the Institute, under the leadership of our dynamic President, Professor Veronica van Heyningen. In the autumn, the new website will be going live, thanks largely to the efforts of Drs Branwen Hennig and Helen Middleton-Price. It promises to be an inspiring and highly informative venture with some interesting features and a new logo.

As a teacher, I am delighted that the Institute is becoming more involved with secondary education, as two new plans demonstrate. In June, the Institute held a very successful first conference for teachers of A-level Biology, with the aim of updating their knowledge of genetics and helping them deliver the new specifications with greater confidence. A full report can be found on page 2.

Secondly, the Institute is to run an essay competition for 6<sup>th</sup> formers

to mark next year's 150<sup>th</sup> anniversary of the publication of Gregor Mendel's research into inheritance in peas. Further details are on page 3.

These projects are aimed at bringing the Galton Institute out of the realm of pure academia and into the public eye, so that more youngsters are encouraged to study genetics and related subjects. We are already reaping the benefits of this with an increase in the number of membership applications.

Elsewhere in this issue, there is a touching obituary for a previous editor of this Newsletter, Bob Cohen. He was well known for his "horror of verbosity" and I can only hope I live up to his high ideals.

On page 4, there is a detailed report on the Fertility and Reproduction Studies Group seminars on 'Infant feeding: nurture and nourishment' held in Oxford last autumn and funded, in part, by the Galton Institute.

The Galton Institute is moving into a new phase with a refreshed public image. I hope that future Newsletters will reflect this and urge members and others to contribute in whatever way they wish. Whether it is a conference report, a book review or an opinion article, all offerings are most welcome.

**Robert Johnston**

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## Genetics in the 21<sup>st</sup> century: a conference for A-level teachers

The first conference for teachers, presented by the Galton Institute, was held on 30<sup>th</sup> June 2015 at the Nowgen Centre in a sunny and very hot Manchester. It was organised by the President, Professor Veronica van Heyningen, Professor Dian Donnai and Robert Johnston, who chaired the event. Over 60 delegates from as far afield as South Wales and the Isle of Man listened to 6 presentations from experts in their fields, focussing on the new areas of genetics which have appeared in the latest A-level specifications.

Robert Johnston opened proceedings with a brief history of the Galton Institute and Sir Francis Galton himself. He considered the aims of the Institute and how they may be fulfilled by conferences such as this and the main conference, held every November. The Institute is also introducing an essay competition for 6<sup>th</sup> formers on 'the contribution of Gregor Mendel to our understanding of heredity'.

Professor Andrew Read, from Manchester, gave the first talk on Genome Organization. He emphasised the randomness and chaos found in genomes and noted that the neat simplicity of Mendelian genetics was the exception rather than the rule. He believed it unfortunate that 'genetic fingerprinting' was still on the A-level syllabuses since 'genetic profiling' has superseded it and is far superior. He also explained the significance of



Professor Andrew Read

'Variable Number Tandem Repeats' and illustrated his talk with answers to typical questions from 6<sup>th</sup> formers.

Professor Graeme Black from Manchester spoke about sequencing methods and applications in genomics. He described how 'next generation sequencing', with its low-cost, high-yield approach is superseding 'dideoxy sequencing' and the impact this will have on predictive medicine.



Professor Graeme Black

He discussed the value of sequencing in cancer treatment as a way of finding suitable targets for highly toxic drugs. He finished by briefly considering ethical issues of 'who owns genetic data' and looked forward to the benefits of the recently announced '100,000 Genome Project'.

Professor Heather Cordell

from Newcastle gave an illuminating explanation of Hardy-Weinberg equilibrium and explained its modern value as a quality control mechanism. She moved on to consider Genetic Drift with some useful examples for A-level teaching. She introduced the concept of 'Single Nu-



Professor Heather Cordell

cleotide Polymorphisms' (SNPs) and concluded with novel examples of GWAS.

After lunch, Dr Diego Villar Lozano from Cambridge considered 'Gene regulation at the genome level' and looked at what makes a cell cancerous. He de-



Dr Diego Villar Lozano

scribed the various types of non-coding RNA and explained how mutation 'outside' genes can perturb gene regulation. He conclud-

ed with his insight into how our knowledge of regulators can lead to better cancer drug targeting for individual patients.

Professor Rosalind John from Cardiff addressed the conference on 'Epigenetics', a topic new to



Professor Rosalind John

many teachers although, on closer inspection, is familiar to all. She used interesting examples to

demonstrate DNA methylation and histone tags. The key message was that methylation is heritable – daughter cells inherit methylation from parent cells with *de novo* methylation. A fascinating example given was the effect of the Dutch famine (1944-5) on women who then gave birth to a generation with greatly elevated frequencies of CHD, obesity and schizophrenia.

Graeme Black returned in the afternoon to consider the successes and future of 'Gene Therapy' especially involving treatment of diseases of the retina. He said that "gene based diagnosis leads to gene based therapy" and considered the pros and cons of different approaches. He pointed out that cost will always be an issue and that some treatments may not last a lifetime. Significant progress has been made, with some

notable successes, but there is still some way to go.

The final session was led by Dr Bella Starling from the Nowgen Public Programmes Team. She described the work done by Nowgen and outlined the opportunities available to teachers and students. Since its inception in 2005, under the guidance of Professor Dian Donnai, over 12,000 students have visited for a taster day and representatives from 15 regional science centres have been trained.

The aim of this conference was to bring secondary Biology teachers up to date with their knowledge of genetics, and the feedback given suggests we were very successful in achieving this.

**Robert Johnston—Editor,  
Galton Institute Newsletter**

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## **Galton Institute Mendel Essay Prize 2016**

The Galton Institute wishes to announce an Essay Prize for A-level students on any aspect of the life, work and/or legacy of **Gregor Mendel**, the father of modern genetics.

This year, 2015, marks the 150<sup>th</sup> anniversary of Mendel's first public communication of his work on breeding of peas, which defined the inheritance laws we now refer to as Mendelian inheritance. A year later, on 8<sup>th</sup> February 1866, Mendel published his findings in the *Proceedings of the Natural History Society of Brünn*.

The competition is open to all students currently studying for A-levels in the United Kingdom and Ireland. The top prize is £1,000,

with two runner-up prizes of £500 and £250 and accompanying certificate.

The deadline for the 2016 essay prize is **8<sup>th</sup> February 2016**.

### **Terms and conditions**

\*The essay should focus on the topic of Gregor Mendel and his contribution to the study of inheritance.

\*Credit will be awarded for essays with stimulating, imaginative and readable content.

\*The Authors should aim to communicate their scientific writing to a lay audience.

\*The essays should not exceed 1000 words and contain an abstract, and a maximum of one illustrative Figure or Table, and five references.

\*All essays should be submitted by the school's Headteacher, after internal selection and approval.

\*The Authors must still be in 6<sup>th</sup> form in February 2016. The maximum number of essays that can be submitted from each school is five.

\*The submitted essays will be checked electronically for plagiarism and marked anonymously by the Galton Institute's dedicated panel of experts. Their decisions are final. The Galton Institute will own the copyright to the winning essays, which may be published in the Institute's Newsletter and on its website.

\*Essays are required to be the original work of the candidate and written and submitted by the competition deadline:

**6 pm 8<sup>th</sup> February 2016**

## **Infant feeding: nurture and nourish- ment**

**Fertility and Reproduction  
Studies Group seminars  
University of Oxford,  
Autumn/Michaelmas term 2014**

This seminar series, generously funded by the Galton Institute and the University of Oxford's Institute of Social and Cultural Anthropology, set out to explore infant feeding as a biocultural phenomenon. The seminars brought together historians, demographers and anthropologists, and developed three main themes: the medicalisation of infant feeding; the role of the state and normalisation; and techniques of care.

Relatively little is known about infant feeding in historical Europe, and the surviving sources pertain largely to elite families. In this regard, **Leah Astbury** (Cambridge) gave an iconoclastic account of wet-nursing in seventeenth century England. Historians have discussed wealthy European women as rarely breastfeeding their babies, it being seen as a nuisance that interfered with the marital relationship and best delegated to wet-nurses. However, Astbury explored letters and diaries that allow us to see seventeenth century women in a different light, as wanting to breastfeed their babies and turning only reluctantly to a wet-nurse in cases of maternal ill-health. They responded emotively to medical writers and Christian preachers who saw breastfeeding as a wholesome, natural and divinely-ordained act. She examined the strong influence of female kin over the decision of whether to

breastfeed or delegate the task to a wet-nurse, as well as their role in identifying a suitable woman to do so. Such a woman, due to the communicative qualities of the milk, should be godly and honest, lest negative characteristics be transmitted to the growing child together with the milk. Importantly too, Astbury questioned the presumed division of society into women who breastfed and women who did not, showing that women turned not only to professional wet-nurses, but also to family friends and poor relations, with whom they had a more trusting, although still unequal relationship.

Medical understandings of breastfeeding at the time were strongly shaped by humoral conceptions of the body. Medical texts implored women to wait up to a week after birth before initiating breastfeeding, as colostrum was understood to be constituted by foul menstrual blood, which had built up throughout the pregnancy, and would make babies ill. These humoral conceptions persisted into eighteenth century Europe, as **Margaret Carlyle** (Cambridge) identified in her paper on the development of breast-pump technologies in enlightenment France. Amid political concerns about population decline and alarm about infant mortality linked with the squalor and abuses of wet-nurses, French writers were authoring reams of literature highlighting the need for breastfeeding. Animal milks were deemed unsuitable alternatives as they were held to unbalance the humours, and feared to convey beastlike characteristics to the child. Yet early nutritional analysis comparing the milk of goats, cows and poor wet-nurses compared the latter unfavourably with the former. The early

breastpumps were invented not by medical authorities but by tinkers, men inspired by the difficulties of their wives and sisters to try their hand at devising technologies to augment women's natural capacity to produce milk. The pumps were intended to siphon off the milk festering in the engorged breasts as well as later collect it in a receptacle so that it might be fed to the baby. The conception of the body was changing, from an understanding of reproduction as part of the natural order, to seeing breastfeeding as a mechanical process to be rationalised and corrected through the right instruments.

Making use of a completely unique dataset comprising more than 50,000 infants born in Derbyshire between 1917 and 1922, **Alice Reid** (Cambridge) offered rich insights into the infant feeding practices of working class women. This dataset comprises the records produced by the earliest health visitors in England. The system of health visiting had been initiated at the instigation of Dr William Howarth, a Medical Officer of Health in Derbyshire who had found the survival of hand-fed infants to be alarmingly less than that of breastfed infants. The health visitors were avid promoters of breastfeeding, in a context where commercial powdered milks were being developed by companies like Glaxo and Cow and Gate, and marketed to middle class women. Reid's analysis shows that 98% of the Derbyshire working women initiated breastfeeding. By three months, 70% were exclusively breastfed and 30% mixed-fed; by six months, 53% were exclusively breastfed; and by one year most were to some extent weaned. Whilst Dr Howarth found the mortality of hand-fed infants to

be three times that of breastfed, Reid recalibrated this by the precise age of the infant and found the mortality of hand-fed infants to be 5.5 times that of breastfed infants. Importantly, infants who were visited within 14 days of the birth had a lower likelihood of hand-feeding, even though these infants tended to be those whom the health visitors deemed weak, such as twins, illegitimate or otherwise sickly babies. Reid is thus able to demonstrate that the health visitors were able to encourage breastfeeding among some of the most vulnerable women, and instruct them how to hand-feed more hygienically.

In the context where infant feeding is now intensely monitored and normalised by a welfare state, **Christine McCourt** and **Juliet Rayment** (London City) explored the practice of mixed-feeding by women of Bangladeshi heritage in the London borough of Tower Hamlets today. Bangladeshi women have a culturally unusual pattern of infant feeding in the British context, in that compared to other women in the same working class neighbourhoods they have higher rates of partial or mixed-feeding. Yet whilst most British women who mixed-feed switch rapidly to a pattern of exclusive bottle-feeding, the Bangladeshi women manage to sustain partial feeding for a long period of time. Exploring the inter-generational influences on the current generation of new mothers, they found that the mother and mother-in-law generation quite frequently supported bottle feeding, which McCourt and Rayment linked to their arrival in England, a country they saw as wealthy and modern, in the 1970s – a time when the expert advice was to promote bottle-feeding. In households that were

frequently multi-generational, older women encourage their daughters and daughters-in-law to mixed-feed, as they see it as quick as and easier than the alternative. However, they also encourage the younger women to feed their infants with their own milk, as it is encouraged by Islam as well as Bangladeshi conceptions of motherhood and the nurturing of mother-child bonds. McCourt and Rayment argued that the public health officials' enthusiasm for exclusive breastfeeding needs to be tempered, and that they need to be encouraged to see mixed-feeding as what's practically possible for the women, and as a relatively healthy way of feeding infants.

**Bronwen Gillespie** (Sussex) discussed another intense form of state monitoring and normalisation of infant feeding, this time in the case of the supplementation of infant weaning foods with iron sprinkles in the Peruvian Andes, where 45% of children under the age of five have iron-deficiency anaemia. In the rural community in which she worked, she found that the use of iron sprinkles was differentiated by social status. The women who were wedded to the project of modernity, and ambitious that their children become urban professionals and leave the peasant life, were willing to include sprinkles into their children's diet. In the same way that malnutrition and slow wittedness might pass from mother to baby through the substances transmitted during pregnancy and breastfeeding, the mothers who followed modern nutritional education during pregnancy reported that it produces an alert baby who's born with its eyes open. Through their responsiveness to modern nutritional education they hoped to build a baby who

would grow up to be other than a peasant. Meanwhile, the poorer women who were heavily invested in their rural livelihoods avoided the sprinkles and instead fed their children red foods like beets, or blood-based dishes, drawing on indigenous techniques for increasing the blood, based on humoral conceptions of the body. They were wary of the sprinkles as they categorized them as a chemical, unnatural, non-food substance, and saw them as suspect due to their association with the government, an entity they saw in the abstract as discriminating against the poor. In its concrete instantiations at rural health posts, they were the subjects of paternalistic patronisation by local health workers from more affluent backgrounds. Gillespie was concerned to draw out the agency of the women who rejected the sprinkles and emphasize what economically productive and caring mothers they were in the context of their own lives.

The last set of papers richly explored the logics undergirding techniques of nourishing care in contrasting ethnographic settings. **Mara Mabilia** (Padua) reported on the distinctions between breastfeeding among Gogo women in Tanzania, with whom she has worked for decades, and the Italian women with whom she has worked more recently. Among the Gogo, she argued that breastfeeding should be understood within the logic of the gift. A mother who breastfeeds receives a return, that is not limited to her satisfaction with the biological stimulation of the infant's suck, which helps her to make more milk, but also by way of the warm and nurturing wider social relations the practice nourishes. Breastfeeding for the Gogo is not seen as natural, but a gesture of giving or offering one-

self. It is a core cultural value, and a mother who breastfeeds is seen as a moral and proper person. Her image as a mother returns to her through the multiplication of relational wealth and communal interdependence. This is illustrated in sharp relief to cases of infant diarrhoea, where the blame is attributed to the mother, who is suspected of breaking the taboo on sexual relations whilst breastfeeding and is cast as a deeply immoral, asocial person until the transgression is remedied through ritual action. Meanwhile, Italian women are instructed that breastfeeding is natural, yet they face indifference from their families and are continually confronted with the ready availability of milk substitutes in the market. The circulation of giving, receiving and giving back is not fulfilling to Italian mothers, as it does not nourish ties that are fully social. Mabilia argued that until the education system and labour markets in Italy recognize women in the fullness of themselves, women will struggle with *having* to give themselves, as per the public health advice, but not knowing *how* to.

**Francoise Barbira-Freedman** (Cambridge) offered another comparative perspective, this time bringing together ethnography from Upper Amazonia with English maternity hospitals. She discussed the *couvade* – a set of dietary and behavioural restrictions brought to a close by shamanic ritual – as part of pan-Amazonian animist ontology characterised by multi-naturalism. She drew a homology between shamanic ideas on illness and the prescriptions and proscriptions of the *couvade*, which can be understood as the carving of a delicate child identity in an animate cosmos where oth-

er beings are continually attacking the barrier between human and non-human. The rituals of the *couvade* ensure the couple's ingestion and immersion in substances that produce a hardening of the jelly-like soul matter of the child. After birth, breastfeeding is a key technique through which substances continue to exchange between mother and baby. Similarly, between father and child substances continue to exchange through the blowing of nurturing shamanic tobacco smoke, co-sleeping and relaxing in hammocks. The *couvade* has been recognized in attenuated forms in Euro-American societies, through folk beliefs known to midwives wherein men manifest symptoms such as weight gain, stomach ulcers and bleeding during their partner's pregnancies, but these have been dismissed as psychosomatic. Intriguingly however, research on the Amazonian *couvade* has been instrumental in creating a new medical orthodoxy about the need for father involvement and early bonding. Today, Euro-American fathers talk to the bump, help their partners give birth, cut the umbilical cord, strip to their shirts to provide skin-to-skin care for their newborns, and support their partners in learning to breastfeed. She identified these institutionalised new rites of shared parenthood as a kind of cosmopolitan neo-*couvade*.

Finally, **Sarah O'Neill** (Antwerp) developed this insight into breastfeeding as a technique that is not only nutritive but also spiritual, with an examination of postnatal protection rituals in the Gambia. Rural mothers in the Gambia do not immediately place the newborn on the breast but nourish the baby first with a set of other substances in order to protect it from spiritual attack. After

cutting the cord the newborn is first washed, to remove the blood and other surrounds which accentuate its vulnerability, and it is then fed honey and a Quranic potion to protect it from spirits. This is made by a marabou, who will write a verse of the Quran on a blackboard, wipe it off and put the essence in a bottle, or write a verse on a piece of paper and put the paper to infuse in a bottle of water and perfume. The lips, tummies and undertongue of the baby are rubbed with kola juice, to ensure that the child will grow up to be a deft orator. Only then will a newborn be put to the breast. In the past, newborns would be fed animal milk or given to a woman with a mature milk supply during the first few days, but health workers today are trying to encourage women to reject these practices and breastfeed immediately. Nonetheless, the cultural significance of spiritual illness is such that their admonitions against the use of Quranic potions are powerless.

Each of the seminars was attended by students and faculty from the Institute of Social and Cultural Anthropology, Institute of Human Sciences and the Medical School, and members of the Lactation Support Unit at the John Radcliffe Hospital. All eight of the seminars were recorded as podcasts, and will be available to listen to from February 2015 at: <http://www.isca.ox.ac.uk/publications/podcasts/>

The convenors are preparing a proposal to *Women's Studies International Forum*, to bring out an interdisciplinary special issue on the basis of the seminars.

**Kaveri Qureshi** and  
**Elizabeth Rahman** (Oxford)

## Robert Donald Cohen 1933-2014

Bob was simply the nicest person you could hope to meet in our profession, or any other for that matter. He was kind, patient, had a delightful sense of humour and was very intelligent. This is not just my personal opinion. People on 19 separate Boards or Committees elected Bob to be their chairman. Two of the most important were the Secretary of State's Advisory Committee on Medical Computing and the Council of the Imperial Cancer Research Fund (ICRF) – more about these later.

His first educational challenge was at the age of 5 years when he was sent to nursery school. He had to prove that he could be left for an hour or so without crying, and that he could descend stairs using one foot after the other; the 'stop and carry one' method of descent was not approved since it was so much slower than the former and might impede evacuation of the school in case of fire. Bob passed this test with flying colours as he did with all his other educational tests. He naturally picked up a 1st. class for both parts of his Natural Science Tripos at Trinity College Cambridge where he was an Open Scholar. Then he completed his medical studies at the London Hospital Medical College qualifying in 1958. One life-changing incident occurred during this period. He was at a lecture in the Bearsted Theatre where he saw a girl he had not noticed before. He

turned to the student next to him to ask who she was. He replied 'that's Barbara Boucher'. I am sure Barbara would have noticed Bob too. He was very good-looking (see photo), over 6 feet tall with a striking athletic physique. This led on to a successful marriage and they had two lovely children.

Bob was a very good mathematician publishing papers involving exponentials and double differential equations and it was natural that the Secretary of State



should chose Bob to chair their Development Committee on Medical Computing. They bought him a real computer (a Univac) whereas we at Barts had to struggle with a Wang Programmable Calculator (a very inferior instrument). Bob and his team set up the Univac so that clinicians could retrieve the results of their laboratory tests on their patients within hours rather than having to wait days for the laboratory to issue paper slips to the ward with the results on them. Bob's system became a sort of Eighth Wonder of the World with people flocking from the four corners of the Nation to view and admire it. However Bob worried that perhaps his own consultants at the London hospital would shrink from using it. So he gave multiple seminars on its value

accompanied by excellent food and good wine. By the end of the day the consultants believed they had invented the system for themselves, singing its praises to less fortunate clinicians working at other hospitals including Barts, and complained loudly on occasions when the system went 'down'.

He started publishing research work on aspects of acidosis in 1967 and had to present some of his findings at a conference to be held at the London Hospital. His paper was the first on the programme and he sat in the third row waiting to be called by the Chairman. Just then a little old man dressed in a ragged old sports jacket with leather patches over the holes at his elbows came in and sat down beside Bob. At the same time there happened to be a meeting of the Hospital Porters Union at an adjacent lecture theatre and Bob assumed the poor old chap had come to the wrong place. Bob was about to redirect him to his right place when he was called to give his paper. At the end he went back to his seat and was surprised when the 'porter' whispered some highly critical comments about Bob's paper. He certainly seemed to be a very peculiar sort of porter. Then someone at the back asked what Professor Hans Krebs had thought about one aspect of Bob's paper. To Bob's horror the 'porter' beside him stood up and made a few polite remarks. Appearances can be deceptive. Bob had nearly directed the Nobel Laureate of 1953 and discoverer of the Krebs cycle and the urea cycle to the Porter's Union Meeting. No harm was done and at the tea break Hans Krebs came up to Bob to introduce a colleague, Frank Woods, and invited them both to write a book on Lactic

Acidosis and he, Krebs, would be honoured to write the Preface. The book was duly written and published which firmly established Bob as an expert in the field of Metabolic Acidosis for which he retained a life-long interest.

In medical administration Bob's work was equally prestigious. He was great at spotting the right person for the right job. For example, whilst Chairman of the ICRF he was set the task of finding a new Director of the Fund following the retirement of Sir Walter Bodmer. His eye was caught by a young man, already an FRS, who was running one of the Laboratories who might be suitable. Bob thought it would be

best to consult with someone who really knew about basic science so he went to Oxford to ask for advice from Professor David Weatherall. When he mentioned Paul Nurse as a possible candidate David Weatherall who is a man of few words took a few puffs at his pipe (which was empty) and said: 'Real Stockholm material that'. Bob then proposed Paul Nurse as Walter Bodmer's successor which was accepted with alacrity by all the panel members. Paul Nurse indeed got his Nobel Prize and after a short interlude at the Rockefeller University in New York became President of the Royal Society, London. For activities like this and many others throughout his career Bob was awarded a CBE in 1997.

I could go on with many more episodes to show what lustre Bob has brought to our Profession. I think we should all be grateful that Bob Cohen chose to grace our particular subject and not be lost to any other in which I am sure he would have been equally successful.

He leaves his wife Barbara, 2 children and 5 grandchildren.

Further reading:  
Cohen R D. *Corpus Hominis: memoirs of an Academic Physician*, Matador Press 2014 pp. 177.

**David Galton**  
**The Galton Institute**

## **GALTON INSTITUTE CONFERENCE 2015**

**The Royal Society**  
**11 November, 2015**

### **MATE CHOICE**

#### **Speakers:**

- Professor Alan Bittles**  
*(Patterns of consanguineous marriage across the world and their consequences)*
- Dr Laura Fortunato**  
*(Mate Choice: A view from evolutionary anthropology)*
- Professor Christophe Guilmoto**  
*(Mate selection in time of demographic masculinization)*
- Professor Melinda Mills**  
*(Mate choice and assortative mating on the internet)*
- Professor Markus Rantala**  
*(Immune defence and sexual selection in humans)*
- Professor Neil Small**  
*(Findings from the 'Born in Bradford' project and their relevance to the understanding of contemporary mate choice)*

Whilst admission is free, we do require a payment from all attendees of £10 towards the cost of a deli sandwich lunch and coffee and tea throughout the day.

Entrance is strictly by ticket, available from:

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19 Northfields Prospect, London SW18 1PE  
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