IN THIS ISSUE

CELEBRATING AND REFLECTING ON THE CENTENARY OF TROPICAL MEDICINE IN AUSTRALIA, 1910-2010

OCCUPATIONAL TRAVEL MEDICINE: PROTECTING THE HEALTH AND SAFETY OF THOSE WHO REGULARLY TRAVEL OVERSEAS FOR WORK

PREPARING FOR FUTURE VOYAGES OF DISCOVERY AND THEIR MEDICAL CHALLENGES. PART 1: ERNEST SANDFORD JACKSON, 1860-1938

AN UNUSUAL HELMINTH INFECTION IN A SOUTH EAST ASIAN REFUGEE

A CASE OF INTESTINAL MYIASIS - FACT OR FICTION?

DELUSIONAL PARASITOSIS: CASE SERIES AND A REVIEW OF THE LITERATURE

MORPHOLOGICAL OBSERVATIONS ON PENTATRICHOMONAS HOMINIS, ENTEROMONAS HOMINIS AND RODENTOLEPIS NANA

EXPEDITION MEDICINE: LAUNCH OF THE COLLEGE’S FIRST SUB-FACULTY
REGULAR ISSUE

EDITORIALS

The Australian Institute of Tropical Medicine Turns 100: celebrating the Centenary of Tropical Medicine
Peter A. Leggat and Derek R. Smith ............................................................................................................... 1-3

In this Issue of the Annals
Derek R. Smith, John M. Goldsmid, Peter A. Leggat and John Frean ............................................................ 4

REVIEW ARTICLES

Celebrating and Reflecting on the Centenary of Tropical Medicine in Australia, 1910-2010
Susan Heydon ................................................................................................................................................. 5-7

Occupational Travel Medicine: Protecting the Health and Safety of Those Who Regularly Travel Overseas for Work
Derek R. Smith and Peter A. Leggat .............................................................................................................. 8-11

Preparing for Future Voyages of Discovery and Their Medical Challenges. Part 1: Ernest Sandford Jackson, 1860-1938
Peter A. Leggat ............................................................................................................................................. 12-15

PARASITOLOGY THEMED SECTION

Case Reports
An Unusual Helminth Infection in a South East Asian Refugee
Richard S. Bradbury, Carol R. Males and John M. Goldsmid ..................................................................... 16-18

A Case of Intestinal Myiasis - Fact or Fiction?
Richard S. Bradbury ...................................................................................................................................... 19-20

Case Series
Delusional Parasitosis: Case Series and a Review of the Literature
John Frean ..................................................................................................................................................... 21-23

Technical Report
Morphological Observations on Pentatrichomonas hominis, Enteromonas hominis and Rodentolepis nana
Richard S. Bradbury, Carol R. Males and Alan Thomas .............................................................................. 24-25

COMMENTARY

Expedition Medicine: Launch of the College’s First Sub-Faculty
Marc Shaw and Peter A. Leggat ................................................................................................................... 26-27

ANNOUNCEMENT

25th Annual North Queensland AIMS Conference / 19th Annual ACTM Scientific Meeting .......................... 28

Cover photo: The Australian Institute of Tropical Medicine in 1916 (photo courtesy of James Cook University)
EDITORIAL

The Australian Institute of Tropical Medicine Turns 100: Celebrating the Centenary of Tropical Medicine

Peter A. Leggat1,2* and Derek R. Smith2,1

1 School of Public Health, Tropical Medicine and Rehabilitation Sciences, James Cook University, Townsville, Queensland, Australia
2 WorkCover New South Wales Research Centre of Excellence, School of Health Sciences, Faculty of Health, University of Newcastle, Ourimbah, Australia

In 2010, there will be a year of celebrations marking the centenary of tropical medicine in Townsville. One hundred years ago, on January 1st 1910, Dr Anton Breinl arrived in Townsville to take up his post as the Inaugural Director of the Australian Institute of Tropical Medicine (refer to Figure 1), which was at that time Australia’s first medical research institute. There have been many milestones in tropical medicine during the past 100 years, some of which are recorded in Table 1. Not least among these was establishment of The Australasian College of Tropical Medicine (ACTM) on May 29th 1991 at a meeting of 10 people held at the Anton Breinl Centre in the library of what was then the AITM. These 10 people became the foundation Executive and Council of the fledgling College, and who are now commemorated on a plaque maintained by the Anton Breinl Centre.

Prior to foundation of the ACTM, the professional interests of tropical medicine were served almost exclusively by the Royal Society of Tropical Medicine and Hygiene (RSTM&H) based in the United Kingdom, although many College members have retained their membership of the RSTM&H. The RSTM&H celebrated its centenary in 2007 and the ACTM was active in hosting a Centennial Lecture series at its annual conference, which was held in Townsville. The need for a professional organisation in tropical medicine for Australasia and the rekindling of professional interest in this field reflected, in part, the re-establishment of academic training programs in tropical health and tropical medicine in Australia during the late 1980’s and early 1990’s at James Cook University and at the Australian Centre for International and Tropical Health and Nutrition (University of Queensland). Anton Breinl’s seminal contribution to the development of Australian tropical medicine was officially recognised in 2002 when the Department of Public Health and...
<table>
<thead>
<tr>
<th>YEAR</th>
<th>EVENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1909</td>
<td>The Australian Institute of Tropical Medicine (AITM) is founded as Australia’s first medical research institute.</td>
</tr>
<tr>
<td>1910</td>
<td>Anton Breinl arrives in Townsville to take up role as the Inaugural Director, AITM; AITM commences operations.</td>
</tr>
<tr>
<td>1912</td>
<td>Appointment of Henry Priestley and William Young to the staff of AITM, effectively making Townsville the birthplace of Australian biochemistry.</td>
</tr>
<tr>
<td>1913</td>
<td>New AITM building officially opened in Townsville.</td>
</tr>
<tr>
<td>1915</td>
<td>Walter and Eliza Hall Institute of Medical Research becomes Australia’s second medical research institute after the AITM.</td>
</tr>
<tr>
<td>1926</td>
<td>The first students graduate with a Diploma of Tropical Medicine and Hygiene (DTM&amp;H) from the AITM in Townsville.</td>
</tr>
<tr>
<td>1928</td>
<td>University of Sydney awards its first Graduate Diploma in Tropical Medicine (DTM).</td>
</tr>
<tr>
<td>1930</td>
<td>The School of Public Health, University of Sydney, assumes the role of research and teaching in tropical medicine. The AITM closes.</td>
</tr>
<tr>
<td>1931</td>
<td>University of Sydney awards its first Graduate Diploma in Tropical Hygiene (DTH).</td>
</tr>
<tr>
<td>1946</td>
<td>University of Sydney records its last award of the DTH.</td>
</tr>
<tr>
<td>1947</td>
<td>University of Sydney records its last award of the DTM.</td>
</tr>
<tr>
<td>1950</td>
<td>Sir Neil Fairley receives a Knighthood for services to tropical medicine.</td>
</tr>
<tr>
<td>1967</td>
<td>Establishment of the 1 Malaria Research Laboratory at the School of Public Health, University of Sydney.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>YEAR</th>
<th>EVENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1973</td>
<td>1 Malaria Research Laboratory moves to the Ingleburn Military Camp; changes name to Army Malaria Research Institute.</td>
</tr>
<tr>
<td>1977</td>
<td>Publication of the 3 part series “Dr Anton Breinl and the Australian Institute of Tropical Medicine” in the Medical Journal of Australia, by Dr RA Douglas.</td>
</tr>
<tr>
<td>1979</td>
<td>University of Sydney records its first award of the Graduate Diploma in Tropical Public Health (DTPH).</td>
</tr>
<tr>
<td>1987</td>
<td>The Kerr White Review of Public Health recommends Commonwealth fund public health research and training (now Public Health Education and Research Program) establishing what is now the Anton Brein Centre for Public Health and Tropical Medicine at James Cook University.</td>
</tr>
<tr>
<td>1991</td>
<td>Foundation of The Australasian College of Tropical Medicine (ACTM) in Townsville; Associate Professor Rick Speare is appointed Inaugural President.</td>
</tr>
<tr>
<td>1993</td>
<td>Re-establishment of a DTM&amp;H in Townsville at James Cook University.</td>
</tr>
<tr>
<td>1996</td>
<td>The Army Malaria Research Institute is relocated to the Gallipoli Barracks, Brisbane, and renamed the Australian Army Malaria Institute.</td>
</tr>
<tr>
<td>2000</td>
<td>Establishment of the Faculty of Travel Medicine of the ACTM.</td>
</tr>
<tr>
<td>2007</td>
<td>Foundation of the Marshall Centre for Infectious Diseases Research and Training, University of Western Australia, and establishment of a Tropical Infectious Diseases stream within a Master of Infectious Diseases.</td>
</tr>
</tbody>
</table>

Table 2 summarizes the Presidents since the Foundation of the ACTM:

<table>
<thead>
<tr>
<th>PRESIDENT</th>
<th>TENURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Richard Speare</td>
<td>1991-1996*</td>
</tr>
<tr>
<td>John M. Goldsmid</td>
<td>1998-2000</td>
</tr>
<tr>
<td>John L. Heydon</td>
<td>2000-2002</td>
</tr>
<tr>
<td>Kenneth Winkel</td>
<td>2004-2006</td>
</tr>
<tr>
<td>Tim J. Inglis</td>
<td>2008-Present</td>
</tr>
</tbody>
</table>

*Terms of Presidency were originally for 1 year (re-electable to a maximum of 5 consecutive years) until they were changed from 1996 to be 2-year terms (also maximum term).
Table 3. Roll of Honorary Fellows of the ACTM, 1991-2008

| Emeritus Professor Danai Bunnag | Hon. MRCP, MRCS, DTM&H, FRCP(T), Hon. FACTM. |
| Emeritus Professor Chamlong Harinasuta | MD, DTM, DSc, PhD, Hon. MD, Hon. FACTM. (deceased) |
| Associate Professor Fred C. Hollows | AO, MBBS, FRCS, FRACO, DObst RCP&S, Hon. FACTM. (deceased) |
| Emeritus Professor Khunying Transanit Harinasuta | MD, DTM&H, Hon. DSc, Hon. FRCP, Hon. FACTM. (deceased) |
| Father Frank S. Flynn | AC, AO, MBBS, DOMS RCP&S, FRACO, DipReligSt, DipAnthrop, Hon. MD, Hon. FACTM. (deceased) |
| Professor David A. Warrell | MA, MB, BCh, DM, DSc, FRCP, Hon. FACTM. |
| Dr Alan D. Charters | AM, MBBS, MD, FRCP, FRACP, DTM&H, BA, MA, MRCP, MRCS, LRCP, Hon. FACTM. (deceased) |
| Dr C.P. Ramachandran | MSc, DrMedSc, DAP&E, AM, CBIol, FIBiol, FMSA, Hon. FACTM. |
| Professor Athasit Vejjajiva | MBBS, MRCP, FRCP (Lond. & Glasg.), FRACP, FRCP(T), FACP, Hon. FACTM. |
| Professor Straun K. Sutherland | MBBS, MD, DSc, FRCPA, FRACP, Hon. FACTM. |
| Emeritus Professor Frank Fenner | AC, CMG, MBE, MBBS, DTM, MD, Hon. MD, FRCP, FRACP, FAA, FRS, Doctor Honoris Causa, Hon. FACTM. |
| Emeritus Professor Margaretha Isaacson | MB BCh, MD, DSc(Med), DPH, DTM&H, Hon. FACTM. (deceased) |
| Professor Robin A. Cooke | OBE, OAM, MD, BS, DCP, FRCPA, MRCPPath, FRPath, FAICD, Hon. FACTM. |
| Professor Karl H. Rieckmann | AM, MBBS, DPH, Hon. FACTM. |
| Ms Fedora Fisher | Hon. FACTM. (deceased) |
| Professor John M. Goldsmid | MSc, PhD, FRCPPath, FIBiol, FAIBiol, FASM, FACTM, Hon. FACTM. |
| Emeritus Professor George S. Nelson | PhD, Hon. FACTM. |
| Professor Sornchai Loaareesuwan | MD, DTM&H, Hon. FACTM, FRCP. (deceased) |
| Professor Rick Speare | BVSc (Hons), MBBS (Hons), PhD, Hon. FACTM, FACTM, FAFPHM, MACVS. |
| Emeritus Professor Ian Riley | MBBS, DTM&H, MRCP, FRCP (Edin), MD, FAFPHM, FFPHM, Hon. FACTM. |
| Professor Mary Ross | BSc, MB ChB, DIH, DPH, DTM&H, FFOM, FFPH, Hon FACTM. |
| Major General Professor John H. Pearn | AO, KSIJ, RDF, BSc, MBBS, MD, PhD, DCH, FRACP, FRCP (UK), FRCP (Edin), FACTM, Hon FACTM, FAFPHM, FRACMA. |

Tropical Medicine at James Cook University in Townsville was renamed the Anton Breinl Centre. The school had previously been located in the original AITM building next to the Townsville hospital. Refer to Figure 2.

The establishment of the ACTM reflected a maturing of the discipline of tropical medicine in Australia and will undoubtedly be an important professional organization for shaping the discipline over the next 100 years. Since its humble beginnings nearly 20 years ago, the ACTM has already become the pre-eminent organisation in the Australasian region representing professional interests in tropical medicine and has regularly achieved page one status during international google.com searches on tropical medicine. The ACTM has seen six Presidents since 1991. Refer to Table 2. In addition to various professional grades of membership for hundreds of doctors, nurses, scientists and other health professionals, the ACTM has also recognised with Honorary Fellowships of the ACTM more than 20 eminent clinicians and scientists, who have shaped tropical medicine nationally and internationally. Refer to Table 3.

This year, 2010, will be an exciting time as a number of activities are held to commemorate the Centenary of Tropical Medicine. Important among them will be two major conferences, both of which will be held in Townsville. The first, to be hosted by the Australian Institute of Medical Scientists (AIMS) and the ACTM, will be held from the 11th to the 14th of June. The second will be the World Melioidosis Conference, to be held from 30 November to December 3rd. All ACTM members are invited to join these celebrations. Further information will be circulated and updated at the ACTM Website, which is available at the following URL: http://www.tropmed.org

References

*Corresponding author
Peter A. Leggat
School of Public Health,
Tropical Medicine and Rehabilitation Sciences,
James Cook University, Townsville, Queensland, Australia
Email: peter.leggat@jcu.edu.au
EDITORIAL

IN THIS ISSUE OF THE ANNALS

This January 2010 issue of the Annals of the Australasian College of Tropical Medicine is divided into three parts: a Regular Issue, a Parasitology Themed Section and a Commentary.

As readers may have already noticed, the first section of the Annals helps celebrate 100 years of tropical medicine in Australia, with an Editorial written by Professor Peter Leggat from James Cook University in Queensland and Professor Derek Smith from the University of Newcastle in New South Wales.\(^1\)

There are two other review articles in the January issue. The first describes an emerging boundary discipline known as Occupational Travel Medicine. Written by Professor Derek Smith from the University of Newcastle in New South Wales and Professor Peter Leggat from James Cook University in Queensland, it is titled: ‘Occupational Travel Medicine: Protecting the Health and Safety of Those Who Regularly Travel Overseas for Work’.\(^2\) The second section of the transcript of the 60th Ernest Sandford Jackson Memorial Lecture presented by Professor Peter Leggat from James Cook University in Queensland is titled: ‘Preparing for future voyages of discovery and their medical challenges. Part 1: Ernest Sandford Jackson, 1860-1938’.\(^3\)

The second part of our January 2010 issue of the Annals is a special ‘themed’ section focusing on parasitology and comprising two case reports, one case series and one technical report. The first case report was written by Richard Bradbury, Carol Males and John Goldsmid from the Department of Microbiology and Infectious Diseases at the Royal Hobart Hospital and the School of Medicine at the University of Tasmania, both in Hobart. It is titled ‘An Unusual Helminth Infection in a South East Asian Refugee’.\(^4\) The second case report, titled ‘A Case of Intestinal Myiasis - Fact or Fiction?’ was also written by Richard Bradbury.\(^5\) There is a case series titled ‘Delusional Parasitosis: Case Series and a Review of the Literature’, that was written by Associate Professor John Frean, Director of the National Institute for Communicable Diseases, National Health Laboratory Service in Johannesburg, South Africa.\(^6\) And finally, there is a technical report titled ‘Morphological Observations on Pentatrichomonas hominis, Enteromonas hominis and Rodentolepis nana’ which was written by Richard Bradbury, Carol Males and Alan Thomas from the Department of Microbiology and Infectious Diseases at the Royal Hobart Hospital and the School of Medicine at the University of Tasmania, both in Hobart.\(^7\)

In the final section of our current January issue, Professor Marc Shaw from Worldwise New Zealand, based in Auckland, New Zealand and Professor Peter Leggat from James Cook University in Queensland have written a Commentary which details the launch of the ACTM’s first sub-faculty - Expedition Medicine.\(^8\) As always, we trust the current issue will be of great interest to readers, and also, that our new publication schedule is providing interesting reading for college members and other associated parties throughout the year.

References

Celebrating and Reflecting on the Centenary of Tropical Medicine in Australia, 1910-2010

Susan Heydon
School of Pharmacy, University of Otago, Dunedin, New Zealand

ABSTRACT
From formal beginnings in Townsville in 1910, the history of tropical medicine in Australia is both uniquely Australian and international. Its centenary is an opportunity to interconnect the advances in scientific knowledge, research and training with issues of politics and race that have shaped it profoundly. The journey from tropical medicine and empire to medicine in the tropics, diseases of poverty and the health of indigenous peoples has been long, complex, and continues today. We must, however, be aware of future challenges that may arise and which could determine the direction of medicine in the tropics over the years to come. Thus, climate change could well determine the future epidemiology, prevalence and distribution of a number of significant infectious diseases, especially vector-borne and soil-borne infections.


Introduction
The founding in 1910 of the Australian Institute of Tropical Medicine (AITM) in Townsville, Australia, marked the formal institutional beginning of tropical medicine in Australia. Although small, the AITM was the first medical research institute in the recently formed federation of Australian states that had brought into being the Commonwealth of Australia in 1901. Its director was Anton Breinl, a leading medical scientist from the Liverpool School of Tropical Medicine. The history of tropical medicine in Australia is an integral part of an international history of a branch of medicine that in the late nineteenth and early twentieth centuries came to be called ‘tropical medicine’.

In the late 1980s historian Roy Macleod wrote in his introduction to the book Disease, Medicine, and Empire: “Medicine, in its conceptual, professional and political dimensions, is both shaping and shaped by the cultural circumstances that surround it, and that give it at any time its particular character”.1 The ‘new’ tropical medicine was intricately associated with empire and an intense nationalistic fervour, but in each setting tropical medicine also shaped and was itself shaped profoundly by the local environment in the broadest understanding of the word. In Australia, the place, the people, wider developments in medicine and health and the ongoing tensions between central and local authorities have all influenced the medicine and its scientific foundations. In 1930, reflecting a developing central government role in health services and growing interest in preventive medicine, the Commonwealth Department of Health incorporated tropical medicine into the School of Public Health and Tropical Medicine at the University of Sydney.2 In 1986, however, the influential Kerr White Report on public health education and training argued for a redistribution of funds to new public health institutions across the states and in 1987 tropical medicine returned to Townsville.3 The Anton Breinl Centre was established within James Cook University and a few years later, at a meeting in Townsville in 1991, the Australasian College of Tropical Medicine was formed.4

The journey over a hundred years from tropical medicine, empire and race to medicine in the tropics, diseases of poverty and the health of indigenous peoples has been long, complex, and continues today. Its history has followed two narratives: one of scientific knowledge, research and training and another of politics, race and Australian identity. Those working in science and medicine have tended to focus on the former, those outside on the latter. In this centenary year, however, we should bring together these two interconnected strands and make it a time for both celebration and reflection.

The Rise of Tropical Medicine
In the late nineteenth and early twentieth centuries interest in tropical diseases was transformed into a new medical discipline – tropical medicine. While the idea of diseases being associated with hot or warm climates has a much longer history4, the concept of tropical disease that emerged by 1900 was different.6 This new discipline sought to distance itself from earlier ideas of disease and climate and establish itself on a foundation of the new sciences of parasitology and bacteriology. With the discovery of the causal organisms of many of the major tropical infections and the isolation of the active ingredients in much of the materia medica (today, pharmacology), hopes increased for preventing or treating some of the world’s deadliest diseases. In the case of malaria, the parasite was identified, the Anopheles mosquito shown to be the vector, quinine could treat the disease and an experiment in 1900 demonstrated that a person staying inside from dusk to dawn could prevent it.7

This “new tropical medicine”8 attracted private philanthropy, had an institutional basis and journals that could link and publish the work of an, at times, competitive and nationalistic international community of researchers and practitioners. Furthermore, in the late nineteenth century 20 per cent of British medical graduates were working in different parts of the empire.9 Patrick Manson, to become Sir Patrick Manson and known as the “Father of Tropical Medicine”, in a lecture in 1897 in London spoke of the lack of training and research in tropical medicine.1 At the same time the Colonial Secretary Joseph Chamberlain was well aware of the hazards that tropical diseases posed for those working in the expanding Empire. Other countries were also acquiring overseas possessions and the founding of the Liverpool (1898) and the London (1899) Schools of Tropical Medicine in Britain was followed by similar institutions in Europe and North and South America.

In the opening address in 1900 to the students of the London School of Tropical Medicine, Sir William MacGregor, then Governor of the British colony of Lagos but in 1909 to become Governor of Queensland, mentioned the work of his “late highly esteemed friend Dr Bancroft of Brisbane”.8,9 Joseph Bancroft was a surgeon and parasitologist born in England who migrated to Australia in 1864 to improve his health.10 This he did, and soon developed a large medical practice. He also carried out research in several areas, but is best known for his discovery of the adult filarial worm. He was also one of the first to suggest that the mosquito was its carrier. While the formal beginnings of tropical medicine in the British Empire are associated with Manson and the founding of the London and Liverpool schools, Bancroft’s work reminds us that tropical disease was neither new nor confined to the tropics. It also serves to highlight the fact that much important work was being undertaken away from metropolitan centres of empire. In the case of Australia, what constituted the ‘tropics’ was also debatable.11 The high temperatures of the north did not have the very high humidity of the tropics and all of Australia is below 75 degrees in winter.

Australian Institute of Tropical Medicine (AITM)
Considerable historical interest has been shown in the colonial politics of race that had a major influence on the establishment and work of the Australian Institute of Tropical Medicine.12-14 The AITM was set up in a region where tropical diseases were present and the institute’s formal functions included gathering knowledge about the diseases of tropical Australia and carrying out teaching and research. Its other official brief, however, was to investigate the possibility of permanent white settlement of Australia’s northern regions. This imperative drove much of the research and to a large extent shaped the discipline of tropical medicine in Australia.

Established just nine years after Federation, the AITM was formed at a time of intense Australian nationalism. The 1901 Immigration Restriction Act prohibited the entry of non-European immigrants and all Pacific indentured labourers were to be expelled by 1906. In addition, Australia’s indigenous population was expected to die out which would free the land for “white
civilization”.13 This presented, however, a major problem in that it was commonly believed that a “working white race” could not successfully colonise tropical regions.13

Although many in Australia hoped that an Australian would be appointed the new institute’s first director, Anton Breinl was chosen by the selection committee in 1909. Breinl was from the Sudeten German part of Bohemia in Central Europe. He qualified in medicine in Prague in 1904 and at the time of his appointment was in the prime of his scientific career, working at the Liverpool School of Tropical Medicine as the Director of the research laboratory at Runcorn. The most detailed account of Breinl and his work at the AITM remains a three-part series by RA Douglas published in the Medical Journal of Australia.15 At Runcorn, Breinl successfully developed the organic arsenical, atoxyl, as the first effective drug for the treatment of sleeping sickness. He also studied and worked under Ronald Ross in Liverpool and, as Lorraine Harloe has written, shared his holistic, practical and preventive approach to tropical medicine.13 In 1910 he was awarded the Mary Kingsley medal for his distinguished contributions to the field of tropical medicine.

With the Commonwealth’s control of Papua in 1906 and the Northern Territory in 1911, new and expanded opportunities for surveying disease and searching for new cures opened up. Breinl travelled through northern Australia and Papua, but he was unable to persuade the Australian authorities to establish a branch laboratory in Papua, where tropical diseases were a more serious problem. In 1911 the Commonwealth took financial responsibility for the Townsville institute and imposed tighter control. Initially the only other member of the unit was his field assistant, but although in 1912 he gained a new building and additional staff his obligations increased to respond to the problem of white settlement of northern Australia.13,15 This issue came to dominate the research programme.

Plans to discuss the “Tropical Question” were to have been held at the Medical Congress of 1914 in Brisbane but were postponed. The First World War seriously affected the work of the AITM and Breinl was also embroiled in personal controversy because of his ancestry although patients and staff at Townsville Hospital unanimously supported him.13 In 1920 Breinl presented the AITM’s three major findings: that the tropical region of Australia was suitable for working white settlers; that there were specific medical conditions, such as leprosy, and many unidentified fevers, which required investigation; and that various shortages had curtailed some programmes and modified others.13 By this time, Breinl was the institute’s only staff member and in 1921 he resigned, although he remained in Townsville where he spent the rest of his working life as a respected medical practitioner.13 The AITM was now part of the Commonwealth Department of Health under its authoritarian Director-General, Dr John Cumpston. The AITM had a number of directors after Breinl, including Raphael Cilento, but in 1930 research and training in tropical medicine in Australia was incorporated into a new School of Public Health and Tropical Medicine (SPHTM) at the University of Sydney.

**Tropical Medicine and Public Health in Sydney**

With the settlement of the ‘working white race’ question historians became less interested in the ongoing development of tropical medicine in Australia. The most useful account for the next 50 years is contained in a commemorative volume produced for the SPHTM’s fiftieth anniversary in 1980.2 While it outlines the work of the School, it did not claim to be “a history since no account is taken of the political backgrounds relating to its administration within a constitutionally sensitive Commonwealth Department”.1 Nor did it discuss the people involved.

Most European Australians lived in the temperate south and the Commonwealth shifted its focus in this direction.16 The move to Sydney and the formal linking of tropical medicine with public health was part of wider trends within medicine and health services in Australia and internationally. More attention was given to preventing disease and the health of populations. The University of Melbourne had offered a Diploma of Public Health from 1906 and Sydney occasionally from 1910.16 In London in the 1920s the School of Tropical Medicine increasingly became concerned with research and teaching of public health worldwide and its new building that was opened in 1929 reflected this trend, becoming the London School of Hygiene and Tropical Medicine. While Liverpool retained its name as a School of Tropical Medicine, a Diploma in Tropical Hygiene was offered for the first time in 1926.17

The move to Sydney was also influenced by ongoing tension in the relations between the Commonwealth and state authorities in health matters. The federal Royal Commission on Health in 1925 recommended the setting up of a School of Public Health and Preventive Medicine and the following year in Melbourne a conference of federal and state ministers of health urged that “the Commonwealth should establish a School of Preventive Medicine and Tropical Hygiene with a view to the teaching of Preventive Medicine on an improved basis to all medical students and other public health personnel”.2 An agreement in 1927 was made between the Commonwealth Government and the University of Sydney for this purpose and was investigated in 1928 by the Parliamentary Standing Committee on Public Works. Such a school was considered to be needed “urgently” for three reasons: the rapid development in the field of public health; that it was necessary for graduates to go abroad to obtain appropriate training in public health; and the “very great importance” of having a proper scientific centre in Australia for tropical medicine and the growing importance of this in connection with Australia’s tropical possessions.5

Cumpston, the Director General of Health for the Commonwealth, was the architect of the proposal. The new School was broader in concept than the AITM, although the institute provided many of its staff. The School of Public Health and Tropical Medicine was opened on 4 March 1930 and in his opening address Cumpston talked of the SPHTM as the “inevitable meeting point of two converging currents in medical education and medical science”.2 He outlined the achievements of the Townsville institute but also pointed out difficulties such as distance, isolation and lack of clinical material. For the new school, he also talked about cooperation with Papua and New Guinea and other island groups in the Pacific. He concluded that although the SPHTM was in Sydney “for the purpose of convenience” it was “designed to serve Australia and its dependencies in the Pacific”.2

The focus of the new school was on training. A diploma course in tropical medicine was taught in the first year as well as various short courses in parasitology and tropical disease. The following year a “Lay Course in Tropical Hygiene” (later called Tropical Medicine) was started. Participants included anthropology students, medical assistants, government workers and missionaries; it was still popular in 1980. Extra-mural teaching in tropical medicine began in Cairns and Townsville in 1935 and was a recurrent feature especially in entomology.2 The early years also saw the commencement of a pattern of field research with fact-finding surveys or specialised surveys. In 1935, for example, five medical officers, the entomologist and four biochemists were away on fieldwork in North Queensland, New Guinea and Papua.2 Staff also began to fill certain honorary or consultative positions.

Unsurprisingly, during the Second World War wartime activities dominated, with service personnel training, visits and surveys. Some of the staff’s research directly influenced service medical procedures in the Pacific campaigns, such as the work of Dr George Heydon in defining the anophele vectors both for Melanesia generally and also northern Australia. As Brigadier Sir Neil Hamilton Fairley, Director of Medicine, Australian Military Forces and Chairman of the Combined Advisory Committee on Tropical Medicine and Hygiene, Headquarters, South West Pacific Area, stated: “On this work was based the whole of the field malaria control methods employed by Allied Malaria Control Services in the South West Pacific.”20

After the war, as with other departments in the SPHTM, tropical medicine began to develop and expand in response to rapid changes in technology, techniques for diagnosis, new methods of treatment, and disease control or eradication.2 The original departments became less discrete and developed to provide a wider coverage of health-related issues. Links with the military continued with the head of department for many years being Consultant in Tropical Medicine to the Army (later Department of Defence). In 1962 Australia became free of endemic malaria, although malaria remains of relevance.

---

6 ANNALS OF THE ACTM January 2010
with its ongoing presence in adjacent regions. A “considerable” amount of work was undertaken on snakes and snakebites. Its teaching role, courses were developed and modified. The training, for example, of Papuan medical assistants in the early years was converted to acceptance of graduates from the Fiji Medical School, and later the University of Papua New Guinea, as candidates for the DTMH. In contrast, the proposed development of a tropical outstation, approved in 1947, did not eventuate.2

New health challenges appeared and attitudes changed. One important area was the increased interest in the health of indigenous people that contrasted with an earlier disregard. The health of the tropical medicine department at the SPHTM became a member of the Project Committee of the Social Science Research Council Project on Aborigines, which produced a “comprehensive” bibliography on the health and disease of Australian aborigines and a study of the health of an aboriginal community in rural New South Wales.2 The late 1960s was a period of considerable political change and heightened awareness of racial discrimination of a disadvantaged group. The two words ‘Aboriginal health’ were not used together in the MJA, the leading generalist medical journal in Australia, until 1969.10 From this period, the number of articles about Aboriginal and Torres Strait Islander people increased dramatically, as David Thomas has shown in the appendix to his study Reading Doctors’ Writing about Race, Politics and Power in Indigenous Health Research.12

Other changes were also affecting the SPHTM. From 1968 discussions and proposals occurred related to the growing emphasis on the problems of social medicine and health care delivery and in 1975 the Committee of Review recommended a re-orientation which was endorsed by the Tertiary Education Commission.2 On 3 March 1980, to coincide with its 50th anniversary, the SPHTM was discontinued and inaugurated as the Commonwealth Institute of Health.

Tropical Medicine Returns to Townsville

The 1980s continued to bring changes for the organisation of tropical medicine in Australia. Internationally, following the 1978 Declaration of Alma Ata and the WHO’s Health for All by the Year 2000 agenda, greater focus in Australia was placed on developing national public health strategies. In 1986 the publication of the Kerr White Report, which made recommendations regarding public health education and research, led to the expansion of public health training.3 It argued, however, for the redistribution of funds from the former School of Public Health and Tropical Medicine to new public health institutions across Australia. In 1987 tropical medicine returned to Townsville as a Tropical Health Surveillance Unit. It was re-established in the former AITM building, and in 1988 became the Anton Breinl Centre for Tropical Health and Medicine. The Centre operates as part of the School of Public Health, Tropical Medicine and Rehabilitation Sciences at James Cook University and today is a research-led postgraduate centre, located on the main campus, offering a range of courses, one of a small group worldwide of internationally recognised centres of excellence in tropical medicine.

The Anton Breinl Centre was also the site for the founding of a new professional organisation, the Australasian College of Tropical Medicine, on 29 May 1991. In the first volume of the College’s Annals published in 1995 Dr Peter Leggat, the Honorary Secretary of the Foundation Executive, wrote of the College being “born out of a desire to have a professional body that sought to represent all aspects of medicine in the tropics”.4 Like the Royal Society of Tropical Medicine and Hygiene, established in London in 1907, the ACTM recognises equality of membership between medical and non-medical members. Reflecting how tropical medicine has been shaped by outside factors, the ACTM also recognises a much broader definition of tropical medicine to include such areas as travel medicine and international health.

Conclusion

The ‘new’ tropical medicine of the late nineteenth and early twentieth centuries was intricately associated with empire and nationalism, but in each setting that the new medical discipline was established it shaped and was itself shaped profoundly by the local environment. While the Australian Institute of Tropical Medicine’s heritage was British, much of its early research was directed towards answering the economic and racial question of whether a working white population could successfully settle the tropical regions of the young Commonwealth. The answer was yes.

Tropical medicine in Australia over the past one hundred years has thus followed a course that has been both uniquely Australian as well as international. From Townsville to Sydney and back again, two narratives continued. One was of advances in scientific knowledge, leading research and training for those providing healthcare in the tropics, whether Australia, the Pacific, or today, further afield. Tropical medicine in Australia, especially from the Second World War onwards, became part of the international and global health arena with its emphasis on preventive health, health of populations and, more recently, primary health care. Yet throughout a second narrative was always present. While concerns with empire and race may have given way to a focus on diseases of poverty and the health of indigenous peoples both in and outside Australia, implementing health policies and programmes continues to be about more than the medicine. In this century we need to reflect as well as to celebrate and we should recognise the possibility that future events such as climate change might well influence the direction of medicine in the tropics or even change the distribution of what we consider the tropics.

References


Corresponding author

SUSAN HEYDON

School of Pharmacy, University of Otago, Dunedin, New Zealand

Email: susan heydon@otago.ac.nz

Vol. 11 No.1

ANNALS OF THE ACTM

7
Occupational Travel Medicine: Protecting the Health and Safety of Those Who Regularly Travel Overseas for Work

Derek R. Smith1,2,3 and Peter A. Leggat2,4

1 WorkCover New South Wales Research Centre of Excellence, School of Health Sciences, Faculty of Health, University of Newcastle, Ourimbah, Australia
2 Anton Breinl Centre for Public Health and Tropical Medicine, James Cook University, Townsville, Australia

ABSTRACT

In the current article we describe the newly emerging field of occupational travel medicine, that is, protecting the health and safety of individuals who regularly travel overseas for work. In recent years as the world embraces a global economy, travelling long distances, particularly by air, has become a common feature in many types of employment. Although most jobs traditionally required people to travel short distances to and from work either by car or public transport, an increasingly large proportion of society are now travelling internationally, usually via aircraft, as part of their job. Many occupations also involve transportation to tropical areas where various diseases exist that may not be present in the worker’s home country. For these reasons, while the clinical needs of the occupational traveller may appear similar to the general tourist, various interrelated factors combine to make travelling for work a much less pleasant experience. Health professionals in travel, tropical and occupational medicine need to work closely together to meet the needs of this steadily growing workforce demographic.


Introduction

The disciplines of tropical and travel medicine encompass a wide array of diseases, patients and clinical fields. One often unrecognized domain of our profession is tropical occupational medicine, that is, protecting the health of workers in the tropics, given that much of the World’s population lives in the tropics and sub-tropics.1 In a previous article,2 we described the close historical relationship between tropical diseases and occupational medicine in Australia, and argued for a greater focus to be placed on tropical diseases that specifically impact working life. Ideally, practitioners in our field should carefully consider potential disease exposures that patients might have had in their work environment, while occupational physicians should remain vigilant for an increasing number of tropical diseases to which workers will be exposed in the new millennium. As an increasing number of tropical diseases, such as dengue fever, threaten emergence and re-emergence in more temperate areas due to the effects of global warming, including in Australia. So too, outdoor workers in these regions will be at increased risk of exposure to these potentially deadly diseases. The emergence and development of a sub-specialty group in ‘tropical occupational medicine’ would be well-poised to deal with emerging challenges that now occur at the work/travel interface (Figure 1).

In the current article, we describe another emerging boundary discipline in our field, this time focusing on the importance of dedicated travel medicine specialists to care for the health of workers who regularly travel overseas as part of their employment. That is, the newly emerging field of occupational travel medicine. In recent years as the world embraces a global economy, travelling long distances, particularly by air, has become a common feature in many types of employment. Advances in air travel technology and accessibility have led to the acceptance of this format as a typical job task,3 and indeed, many companies often assume that their employees are now ‘transnationally competent’.4 The United Nations World Tourism Organisa-

What is an Occupational Traveller?

Although an exact definition is open to debate, for the purposes of this discussion we will consider an ‘occupational traveller’ an individual who has a permanent home base and tends to stay in foreign countries for a short period of time for employment-related reasons. Extended stays in foreign countries may also occur within this employment demographic, although these individuals would usually come under the category of expatriate, a demographic not for discussion in the current article. Regardless of duration of stay, the literature clearly demonstrates an increasing trend for people to travel internationally and further afield.5,6 Airline travel is probably the most common method for work-related travel over long distances, and the health issues of this method have already been well-documented by others, mainly in relation to short-term international tourism. Compared to the issues faced by tourists however, relatively few studies in travel medicine periodicals appear to have specifically investigated occupational health issues among the occupational traveller. We intend to address this shortfall in the current article.

Common Health Problems Faced by the Occupational Traveller

Some common health problems faced by the occupational traveller are summarized in Table 1. International travellers are well-known to be at risk of illness and injury from a variety of sources.7 The impact of travel on health may be significant, with a previous study finding that 38% of travellers suffered health impairment, of which 14% were incapacitated.8 Diarrhoea and upper respiratory infections represent some of the most common travel-related illness in general travellers.9 Probably one of the most well-known issues for the occupational business traveller, like any tourist, will be jet-lag. Jet lag is a recognised circadian rhythm sleep disorder characterised by insomnia or excessive daytime sleepiness associated with transmeridian jet travel.10 Adjusting circadian rhythms to a new sleep/wake schedule is often slow and impeded,10 although this will tend to resolve in time. Even so, relatively uncomplicated medical issues, such as jet lag, highlight perhaps the most fundamental point of occupational business travel; that many problems faced by the short-term business traveller are essentially similar to those of...
Table 1  Health Problems Potentially Faced by the Occupational Traveller

<table>
<thead>
<tr>
<th>Health Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleep disruption, jet lag and other sleep-related disorders</td>
</tr>
<tr>
<td>Deep Vein Thrombosis (DVT) ‘Economy Class Syndrome’</td>
</tr>
<tr>
<td>Travellers’ diarrhoea, food poisoning and food borne illnesses</td>
</tr>
<tr>
<td>Accidents and injury due to domestic work-related travel in the host country</td>
</tr>
<tr>
<td>Parasitic disease risk for health care workers, scientists and researchers</td>
</tr>
<tr>
<td>Blood borne disease risk for health care workers, scientists and researchers</td>
</tr>
</tbody>
</table>

Table 2  Why the Problems of Occupational Travellers Differ from those of Tourists

<table>
<thead>
<tr>
<th>Potential Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locations, times and dates are not chosen for enjoyment, interest or potential adaptability to the traveller</td>
</tr>
<tr>
<td>Country, language, people and culture are not usually chosen for their potential compatibility with the traveller</td>
</tr>
<tr>
<td>Unlike holidaymakers, there is usually no chance for rest upon reaching the initial destination</td>
</tr>
<tr>
<td>The occupational traveller is usually very busy when away, as the person is usually travelling for the sole purpose of working</td>
</tr>
<tr>
<td>Potentially increased risk for violence when compared to tourists, as work-related travellers are usually wearing more expensive attire</td>
</tr>
<tr>
<td>There is usually a limited opportunity to recover after returning to the traveller’s home country, as their schedule often means returning straight back to work</td>
</tr>
</tbody>
</table>

the tourist, but their recovery is severely impeded by time and other practical constraints due to inflexibility in work scheduling. Workers are not usually free to choose the most comfortable flight schedules or cabin classes to suit their needs. This highlights the broader conundrum of why tourists differ from occupational travellers (Table 2).

Overseas Tourist versus International Occupational Traveller

While research has clearly demonstrated the importance of choosing an appropriate itinerary to help reduce jet lag and maximize optimal performance, for example, having flexible itinerary choices and meeting schedules is not usually possible for the business traveller. There are a few common reasons for this. Firstly, it is well-known that when flying long distances, the direction of travel (east to west or vice versa) is important. Although sleep disturbances occur following both westward and eastward flights, side effects do differ from each other in certain features. Resynchronization of salivary hormones such as cortisol and melatonin for example, tends to occur more rapidly after westward flights than vice versa. Although research has shown that eastbound flight layover sleep can be more problematic, unlike tourists, occupational travellers are usually unable to schedule the direction of their flights, regardless of which direction may actually be the most favourable from a health and comfort perspective. Indeed, the issue of travel scheduling highlights perhaps the most important factor when travelling for work, and that is, unlike tourists the occupational traveller usually has limited choices when scheduling their travel. Similar to flight direction, occupational travellers are also constrained when deciding which times, dates and locations are most suitable for them.

Secondly, there is usually little chance to recover upon returning home from occupational travel. It is well known that academics for example, often suffer from disturbed sleep-wake patterns upon returning from conferences. However, unlike tourists, occupational travellers usually return to work immediately after travel. The effects of sleep disruption and jet lag are often enhanced due to a general lack of opportunity for recovery upon arrival in the new country and upon return to the home country. Interventions to help alleviate the problem tend to be suboptimal in this situation. Melatonin, for example, has shown to be of little benefit in alleviating jet lag in persons who followed a busy schedule after arrival. Thirdly, the choice of cabin classes, particularly the desire to travel in a more comfortable manner (i.e. premium economy, business class or first class) as a means to help ameliorate travel-related discomfort, is often severely limited when travelling internationally for work. Many companies and institutions, particularly universities and increasingly many public service departments, will only cover the costs of economy class travel when using corporate finances. In most Australian universities for example, paid premium travel is often restricted to the highest level executives. As such, the choice to spend a little more on one’s air ticket, and thereby have a more comfortable flight, is often unavailable to the occupational traveller.

Other Health Issues besides Jet Lag

Travellers’ diarrhoea represents one of the most common, travel-related maladies for any traveller, regardless of category. In a previous study conducted in Switzerland, for example, travellers’ diarrhoea affected 26% of all those investigated, and caused incapacitation in 38% of cases. While the innate risk initially appears similar to that faced by tourists, locations and countries visited by the occupational traveller are not usually chosen for their culinary interest or suitability to the individual. On the other hand, it is reasonable to assume that tourists and holidaymakers will usually reject travel to countries where unpalatable food choices, potential allergies or unhygienic conditions exist. Again, the occupational traveller often has no choice in this regard. General health and hygiene facilities may be lower in other countries, making it difficult for the employee to remain healthy despite his or her best intentions.

Food safety is clearly important, and while the dangers of unhygienic conditions are usually well-known, occupational travellers, unlike tourists, often do not have sufficient time to pick and choose where and what they eat. Busy workers may not have the luxury to abide by the cardinal rule to ‘boil it, cook it, peel it or forget it’. Eating food ‘on-the-go’ is a common aspect of everyday working life, and this habit may be continued by necessity, among occupational travellers. Repeated illness experienced by the occupational traveller may lead to a lack of motivation regarding overseas travel, perhaps even culminating in outright refusal to travel. Experienced members of multinational corporations may be lost from the workforce in this manner.

Parasitic diseases also pose a risk for health care workers and researchers, particularly aid workers, who travel to underdeveloped countries and disease endemic areas as part of their work. Travelling health care workers, by definition, will often be exposed to some of the sickest and most infectious people on a constant basis, thus enhancing their own potential to become ill. Exposure to endemic diseases is also important and should not be overlooked. Cases of ‘traditional’ tropical diseases such as Dengue, for example, are on a continuous rise. Furthermore, exposure to virus serotypes which are genetically unfamiliar will almost certainly increase the risk of contracting a particular disease. Outbreaks of Severe Acute Respiratory Syndrome, or SARS, during 2002 demonstrated how air travel itself can have an important impact on the spread of diseases.
role in the spread of newly emerging infections. Seasonal influenza epidemics represent a relatively minor, though nonetheless important issue in this regard for the occupational traveller. Cases of transatlantic spread of Methicillin Resistant Staphylococcus aureus (MRSA) have also been reported among health care workers, for example. As a result, health care workers who travel as part of their job may be exposed to a greater range and higher concentration of pathogens than the leisure traveller would have otherwise avoided, even when both groups visit the same area.

Skin diseases that are otherwise uncommon in the worker’s home country may become problematic when travelling to certain overseas locations, particularly tropical areas. Tropical skin diseases of a bacterial origin are known to include bartonelliosis, tropical ulcers, tropical pyomyositis, granuloma inguinale, lymphogranuloma venereum, yaws, pinta, cutaneous tuberculosis, leprosy, buruli ulcers, plague, anthrax, melioidosis, glanders, tularemia, vibrio vulnificus, and more. Digestive disorders, including constipation, may become chronic among occupational travellers who constantly change their diet due to local conditions. Musculoskeletal disorders and deep venous thrombosis may occur due to long periods of static postures in airline seats, which is followed immediately by sitting down at a desk or conference chair, placing occupational travellers at particularly high risk. Depending on which country they visit, people who travel for work will have an increased requirement for prophylactic vaccination, simply because they travel so frequently. Complacency may result in occupational travellers who then choose to be unvaccinated when visiting countries with endemic, and otherwise vaccine-preventable, health risks.

From a psychological perspective, occupational travellers may discount or ignore medical problems, which are travel-related, simply because they experience such issues on a regular basis. This situation has two potentially adverse outcomes. Firstly, while many minor ailments will spontaneously resolve when a traveller returns to their home environment, the cumulative effect of these issues may lead to long-term sequelae. Secondly, the veteran occupational traveller may become complacent about minor symptoms, and thereby ignore a genuinely serious medical condition, leading to advanced disease. On the other hand, access to appropriate health care professionals may also be difficult when travelling, with language barriers often representing a significant barrier for travellers when accessing medical facilities in other countries.

Longer term travellers and their families are believed to be particularly prone to a range of psychological stressors whilst overseas, and indeed, many expatriates find their new work extremely stressful during a foreign assignment. This concept is not entirely new, however. Even a century ago, attrition rates among workers sent to tropical environments had been shown to reach 40%, with the majority relating to ‘nervous conditions’. In a more recent study of international business travellers at the World Bank, over one-third of respondents reported experiencing high to very high levels of travel stress. Stress may also affect the traveller’s spouse, with one study revealing that around half of travelling spouses experienced high to very high stress levels. Although in 1960 Oberg originally coined the term as an occupational disease of people who have been suddenly transplanted abroad, culture shock is now recognized as a condition that can occur whenever one enters a new culture or returns to their original environment.

### Potential Impact on the Employer

Aside from its direct effects on the travellers themselves, travelling for work may also impact the occupational traveller’s employer, some issues of which are summarised in Table 3. Aside from potential workers’ compensation costs given that the occupational traveller is usually being paid some kind of salary, falling ill when travelling for work will usually incur a certain degree of financial loss for the employer. While these costs may often go unrecognised to the employer, they can be substantial. In a previous study from Switzerland for example, the average period of time lost due to illness was 3 days, which corresponded to 2% of the entire time away. There also exists the issue of costs incurred by occupational travellers versus equivalent employees who did not venture overseas. When travelling staff have been compared to non-travelling staff, for example, there have been 80% higher claims on medical insurance across all ICD categories, especially infectious diseases and psychological issues, and 16% higher claims on medical insurance for mental health issues.

For these reasons, it is easy to see how travel-related illness can incur a significant burden for the employer as well as the employee. Aside from lost time and financial issues due to lost productivity, dispatching employees to foreign lands also incurs a moral conundrum of sorts. At worst, employees could be seriously injured or killed when travelling overseas. Employers may also be inadvertently exposing their staff to unknown hazards in many different forms, such as biological, physical and psychological. Occupational health and safety standards may be lower in other countries, the importance of which comes into play when we consider that employees are required to work whilst overseas. To a large extent, this also depends on where they go. Expatriate health issues are generally believed to be more important when one moves from a developed to a less developed country, for example. Long-term travellers are generally exposed to greater risk than short-term travellers, and as such, duration of travel is similarly important. Given these complicated and interwoven issues, the ethics and morality of imposing occupational travel on employees remains an issue that needs to be seriously considered by management.

### Clinical Assessment of the Occupational Traveller

Clinical assessment of the occupational traveller need not be a daunting process, and indeed, many strategies used for assessing returned tourists will also be appropriate in this situation. Regarding pre-travel assessment, similar to that of general tourists, one of the main dictating factors will be assessing whether the individual is actually fit enough to travel by air. Coronary heart disease is a major contraindication and needs to be considered within the boundaries of current evidence-based practice. Certain individuals will likely be at higher risk than others, and as such the pre-travel consultation affords an opportunity to consider relevant clinical history, potential special needs and a detailed analysis of the proposed itinerary. Organizational factors should be considered, particularly regarding the ‘abruptness’ with which companies often send employees on international assignments. Personality of the individual is also believed to be important, and for these reasons, it had been suggested that someone with high self-esteem and a positive state of mind is believed to be ideal.

Itinerary is particularly important because significant regional differences are known to occur regarding place of exposure. Assessment of the returned occupational traveller can often follow the protocols of assessment of returned travellers, generally. The returned traveller can generally be divided into those who are well, those who believe they are well but are not, those who are worried about being well, and those who become so ill when abroad that they are prematurely returned to their home country. Specific clinical manifestations of individual diseases to which occupational travellers may have been exposed vary, and have been described in detail elsewhere.

### Table 3: Potential Issues for the Employer Regarding Occupational Travel

<table>
<thead>
<tr>
<th>Issue</th>
<th>Impact</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel-related illness may incur lost work-time and lost productivity</td>
<td>Unpaid leave, decreased productivity, financial losses, and reduced efficiency</td>
<td>Medical claim for lost work-time and lost productivity due to illness</td>
</tr>
<tr>
<td>At its worst, employees could be seriously injured or killed when travelling overseas</td>
<td>Direct financial loss, potential legal and reputational damage</td>
<td>Victim of a road accident while travelling on company business</td>
</tr>
</tbody>
</table>
when assessing returned travellers, generally, clinicians are advised to con- 
sult the latest evidence-based guidelines when assessing the returned 
occupational traveller.

Treatment and Recovery

Unlike holidaymakers, occupational travellers who travel for work may have little or no time to recover from the innate stressors of long distance travel when they arrive at their final destination, particularly if entails structured events with schedules that cannot be altered, such as academic conference. Due to their tight schedules and relatively short durations of stay, often a result of tight travel policies that do not permit the inclusion of ‘‘down-time’’, occupational travellers may experience reduced opportunity for access to medical services in the host country. Intrinsic differences in health care delivery in the host country are also important. This may result in diseases and maladies progressing to more advanced clinical sequelae, which could otherwise have been easily treated at an earlier stage. Occupational travellers also encounter problems when they return home, as many are required to return to work immediately. Aside from jet lag and sleep deprivation, this unfavourable situation reduces the possibility of re-acclimatisation by many other body systems.

Conclusion

Overall, it can be seen that while the clinical needs of the occupational traveller may appear similar to that of the general tourist, various interrelated factors combine to make travelling for work a much less pleasant experience. Although humans have travelled since time immemorial, this activity has also influenced disease patterns which shaped history itself. Somewhat surprisingly however, few historical treatises have focussed on the plight of the occupational traveller. One notable exception is Phileas Fogg’s return in perfect health following an ill-prepared 80 day trek around the world, an astonishingly healthy result however, few historical treatises have focussed on the plight of the occupational traveller. Indeed, very few investigations of this nature appear to have been carried out. Postgraduate training in travel medicine should also consider incorporating some aspects relevant to the occupational traveller.

References


**Corresponding author**

Derek R. Smith

WorkCover New South Wales Research Centre of Excellence, School of Health Sciences, Faculty of Health, University of Newcastle, Ourimbah, Australia

Email: derek.smith@newcastle.edu.au
REVIEW

60th ERNEST SANFORD JACKSON MEMORIAL LECTURE


Peter A. Leggat

School of Public Health, Tropical Medicine and Rehabilitation Sciences, James Cook University, Townsville, Queensland, Australia

ABSTRACT

Ernest Sandford Jackson was born in Sandford, Victoria, on 18 July 1860. He studied at the Geelong Grammar School and then at the Trinity College, University of Melbourne, in Victoria, Australia. He graduated in Medicine in 1881 and was Medical Superintendent of the Brisbane Hospital from 1883-1898. He then entered private practice as a consultant surgeon in Queensland, having developed interests in several areas, including cancer and mosquito-borne diseases. Following the outbreak of World War I, he enlisted in the Australian Army Medical Corps in 1914, was commissioned as a Major, and posted to Cairo, Egypt. He was invalided back to Britain in 1915 and then to Australia, returning in early 1916. He ceased full-time Army service. He was promoted to Lieutenant Colonel and served part-time from 1916 until he retired from military service in 1919. In the meantime, he continued in private practice in Australia, where he served on various government and professional bodies. He wrote on the history of sea exploration and medicine, which was the topic of the inaugural Jackson Lecture, named in his honour by the Queensland Branch of the British Medical Association, and delivered by him in 1931. Jackson retired in 1934 to undertake more agricultural pursuits and died in Brisbane, Queensland, on 29 June 1938. Ernest Sandford Jackson was a founder of a number of professional medical organisations, including the Queensland Branch of the British Medical Association, the Australasian College of Surgeons, and the University of Queensland Medical School. He will be remembered as one of the significant medical pioneers of the late 19th and early 20th Centuries in Australia.


Introduction

Ernest Sandford Jackson was one of the significant medical pioneers of the late 19th and early 20th centuries. He was born on the 18th of July 1860 at Sandford Station, Victoria, the son of John Henry Jackson, a Tasmanian-born grazier, and his wife Mary Ann (nee Bowtell). Sandford Station had originally been established as a pastoral run in 1838. It grew to become a rural hamlet-now known as the Wannon River Valley, south of Casterton in South West Victoria. Sandford celebrated its centenary in 1938. Figure 1 shows a digital image of a 1865 oil on canvas painting of Sandford Station entitled “Sanford” [a.k.a. Sandford], an Australian homestead. Sandford House, as it was known then, had originally been sold to Samuel and William Jackson of Melbourne. Their nephew, John Henry Sandford (1829-1915), was sent from Tasmania in 1847 to manage “Sandford House”, where he remained until his death in 1915.

Education

Ernest Sandford Jackson was educated at Geelong Grammar School in Victoria. Academically and athletically gifted, he entered the University of Melbourne aged 15 years in 1876. He entered Trinity College and was formally enrolled to study medicine at the University of Melbourne. He became fully involved in the life of Trinity College and developed a passion for rowing both for Trinity College and the University of Melbourne. He graduated with his Bachelor of Medicine and Bachelor of Surgery (M.B., Ch.B.) on the 3rd of December 1881. Dr E. Sandford Jackson had been assisting at the Melbourne Hospital since the 4th of January 1882, when he applied for a Residency appointment, a position for which he was not selected. It appears that he was making job enquiries in several centres, including Sydney, Melbourne and Hobart.
Medical career

Dr. E. Sandford Jackson was employed as a Junior Resident Surgeon in June 1882 at the Brisbane Hospital and was appointed Medical Superintendent in February 1883. A portrait from his younger years shows that he was already sporting his trademark moustache (Figure 2). In his first few years working at the Brisbane Hospital, Jackson was reported to be “frequently in failing health through overwork”. This was not surprising, especially as he was confronted with a major outbreak of typhoid fever during which Queensland reported the highest mortality rates in Australia at that time. Described as a strict disciplinarian, he considered patient care paramount. He founded Queensland’s first training school for nurses in 1886. On the 14th of August 1890, he married a nurse, Christina Bain. They had seven children. Jackson entered private practice as a surgeon in 1898 with a visiting, later consulting appointment at the Brisbane Hospital, since honorary appointments were considered necessary for professional success in that era.

Dr. E. Sandford Jackson bought St Helen’s private hospital around 1900. He invited many prominent Brisbane surgeons of the time to use the hospital’s facilities to treat their patients. St Helen’s was to become a precursor to the famous Wesley Hospital, one of Australia’s largest private hospitals, now sited at Auchenflower, Brisbane. His name is perpetuated at the Wesley Hospital by the naming of the Sandford Jackson Building, which hosts many specialist clinics and facilities. The Sandford Jackson Portrait Frieze, sculpted from Helidon freestone (a beautiful iron-striped sandstone), is the work of Rhyl Hinwood, a renowned Brisbane sculptor. It was commissioned in 1998 and is located at the entrance on the ground floor of the Sandford Jackson Building (Figure 3). In addition, Sandford Street, St Lucia, was also named in honour of Dr E. Sandford Jackson. Sandford Street was built on subdivided land on a property called Glenolive (Grenolive Lane also remains), which Dr Sandford Jackson had purchased in 1901 and where he lived with his family until 1925.

Jackson contributed greatly to the profession. As a foundation member of the Queensland Branch of the British Medical Association, he was its President three times, in 1895, 1911 and 1926. This record of Presidential Service is also held by his contemporary, Dr William Nathaniel Robertson. Jackson was a strong advocate for community issues of the day. In 1911, when giving evidence at the bar of the Queensland Legislative Council, he argued for continuation of what was then controversial venereal diseases legislation directed mainly at prostitutes. This referred to local hospitals. He published several papers on lymphatic filariasis and was an advocate for mosquito control. Indeed, he gave a public address, which he published, on the 12th of June 1911 on the importance of controlling mosquitoes and mosquito-borne diseases in Queensland, especially in relation to filariasis and dengue, as well as the perceived threat of yellow fever; a message that is just as relevant for Queenslanders today.
or invalided because of war service. The work of that Commission helped to forge the policies upon which the Department of Veteran’s Affairs still operates today.1,13 Jackson had previously been appointed a Member of the Commission into lead poisoning in 1918.1 In 1926, he launched a campaign to establish the Queensland Cancer Fund.1 He was highly regarded as a pioneer cancer surgeon3 and performed the first prostatectomy in Queensland, using the Freyer’s technique first described in 1901.16 He was also a Member of the 1930 Royal Commission into Public Hospitals.1

Later in his life, Dr. E. Sandford Jackson also began to make his mark as a keen historian and he researched the history of sea exploration and of medicine.1 As a Vice-President of the then (Royal) Historical Society of Queensland from 1930 to 1935, he contributed actively to its proceedings.1 He accepted the invitation in 1931 to deliver the first annual Jackson Oration established in his honour by the then British Medical Association’s Queensland Branch Jackson entitled it “Some voyages connected with the discovery of Australia; their medical history”.1,17 In it he described numerous tall ship sea expeditions dating from the 13th Century to the 18th Century, including those of Captain James Cook. He had a particular interest in the illnesses and conditions experienced by the sailors on these voyages. Conditions he discussed included malaria, tuberculosis, dysentery, drowning, and being frozen to death. He also described scurvy and alcoholic poisoning.17 A later portrait of an older Dr E. Sandford Jackson, portraying him still sporting his trademark moustache18 (Figure 5).

Following a medical career that spanned more than half a century, Dr E. Sandford Jackson retired in 1934 to his Bayside property, Koorakooracup, a house at Victoria Point, which was named after a station owned by his family in Victoria.1,2 Here, he indulged his love of horses, history and gardening.1 His retirement was announced in The Age newspaper in Melbourne on the 2nd of July 1934, where he was acknowledged for his extensive contributions to medicine and to the Queensland Historical Society.19 The Age also noted that Dr Jackson was “still a fine horseman and judge of a horse”.19 He died of

Military service

With the outbreak of World War I, like many other Australians, Dr E. Sandford Jackson enlisted in the Australian Imperial Forces (AIF). In November 1914, he left Australia with the (First) AIF as a Major in the 1st Australian General Hospital in Egypt, where he was photographed on the steps of No. 2 Australian General Hospital, Cairo, 1915 (Figure 4).1,15 He was invalided home in November 1915 following a severe bout of pneumonia complicated by a lung abscess and empyema.1,4 Back in Brisbane, Jackson was discharged from full-time Army service, but was appointed to part-time service and promoted to Lieutenant Colonel.4 He was appointed as one of two visiting surgeons to No. 6 Australian General Hospital, a military convalescent hospital opened on the 19th of July 1915 at Kangaroo Point, Brisbane.4 He left the No 6 Australian General Hospital and retired from military service in January 1919,4 but continued in private medical practice.

Later years

After demobilization, Jackson remained active in the community. He purchased a Bayside property at Victoria Point, Koorakoorakup, in 1920.4 In 1924, he was appointed Royal Commissioner on a Federal Commission, which determined policy for the treatment of, and pensions for, those injured

Figure 5 Portrait of Dr E. Sandford Jackson  (unknown date)

Source: John Doley Library, State Library of Queensland
hypertensive heart disease at St Helen’s Hospital on the 29th of June 1938. Although he did not live to see the opening of the University of Queensland Medical School in 1939, he was a great supporter of its development. It has been said that his desire for state funding to be diverted to develop a medical school in Brisbane influenced him to remain silent on the issue of the closure in Townsville and the subsequent move to Sydney of the Australian Institute of Tropical Medicine in 1930. Indeed, he was an extremely influential figure in medical politics at the time.

Epilogue

Writing in 1987, Parker and Pearn noted that “The Jackson Lecture is the only named Australian Medical lecture to date, to be given by the person being so honoured, emphasising the high esteem in which Dr E. Sandford Jackson was held by his colleagues”. From 1931 to 2008, there have been 60 Jackson Lectures. The first Jackson Lecture delivered in northern Queensland was presented by Professor Ken Russell. It was held in association with the North Queensland Medical Conference (NQMC) in Cairns in 1972 and was formally hosted by the NQMC from that time. Now known as the Ernest Sandford Jackson Memorial Lecture, it became a biennial event in 1978. It is significant that the 60th Ernest Sandford Jackson Memorial Lecture, which was presented on World Teachers’ Day 2008 – the 31st of October 2008, was held in the Robert Douglas Auditorium. The Auditorium was named in honour of Dr Robert A. Douglas, a pioneer north Queensland specialist physician, who presented the 1976 Ernest Sandford Jackson Memorial Lecture on the topic of “Dr Anton Breinl and the Australian Institute of Tropical Medicine”. A commemorative medal is awarded to those selected to present the Ernest Sandford Jackson Memorial Lecture (Figure 6). Most of the Jackson Lectures presented, especially during the first 50 years, were published, usually in the Medical Journal of Australia.

Figure 6 Scans of the Commemorative Medal Presented in 2008 for the 60th Ernest Sandford Jackson Memorial Lecture: Obverse (Left) and Reverse (Right)

Since Dr E. Sandford Jackson delivered the first Jackson Lecture entitled “Some voyages connected with the discovery of Australia; their medical history”, the time taken for global travel has reduced enormously. Today, it takes about 24 hours to travel from the United Kingdom to Australia. Indeed, with the mode of travel discussed by Dr E. Sandford Jackson in his Inaugural Jackson Lecture, there were very different medical risks for travel. In his day, the time taken to travel from the UK to Australia was in the order of one year or more! The medical challenges of modern travel will be discussed in Part 2 of the 60th Ernest Sandford Jackson Memorial Lecture, which was titled “Preparing for future voyages of discovery and their medical challenges”. The author chose this title both as a tribute to the first Jackson Lecture in 1931 and as a reflection of the emerging specialty of travel medicine today. The words by the American Poet, John Greenleaf Whittier, quoted in part on his memorial Portrait Frieze at the Sandford Jackson Building (Figure 3), cause us reflect on past, present and future yearnings for travel.

“I hear the tread of the pioneers, Of nations yet to be; The first low wash of waves Where soon will roll a human sea”

Acknowledgments

This was the first part of the 60th Ernest Sandford Jackson Memorial Lecture presented on Friday the 31st of October 2008 at the Robert Douglas Auditorium, The Townsville Hospital, Townsville, Queensland, Australia. The Lecture is hosted by the Queensland Branch of the Australian Medical Association (AMA). The first Jackson Lecture was presented in 1931 by Dr Ernest Sandford Jackson himself. The author expresses his appreciation to the then Queensland President of the AMA, Dr Chris Davis, for the honour of inviting him to present this esteemed Lecture and also to Major General Professor John Pearn, AO, RFD, for his guidance and advice concerning this manuscript.

References


Corresponding author

Peter A. Legget
School of Public Health, Tropical Medicine and Rehabilitation Sciences, James Cook University, Townsville, Queensland, Australia
Email: Peter.Legget@icu.edu.au

Vol. 11 No.1

ANNALS OF THE ACTM 15
CASE REPORT

An Unusual Helminth Infection in a South East Asian Refugee

Richard S. Bradbury,¹,²* Carol R. Males¹ and John M. Goldsmid²

¹ Department of Microbiology and Infectious Diseases, Royal Hobart Hospital, Hobart, Tasmania, Australia
² School of Medicine, University of Tasmania, Hobart, Tasmania, Australia

ABSTRACT

Three faecal specimens for parasitic examination from a clinically well three-year-old South East Asian refugee with a history of eosinophilia, who had previously been treated for a Giardia intestinalis infection, were submitted to the Department of Microbiology and Infectious Diseases of the Royal Hobart Hospital for faecal parasite investigations. No parasites were seen in the formalin-ethyl acetate concentrate of the specimens. A small number of modified acid-fast bodies were observed in the modified iron haematoxylin-stained permanent smears. These bodies resembled larvated hookworm eggs, but were much larger and more cylindrical. Some were asymmetrical in shape and others showed some degree of unipolar tapering. Following this finding, a new formalin-ethyl acetate concentrate of the patient’s stool was thoroughly re-examined and the eggs were found to be present in very low numbers in this specimen. The eggs were identified as possibly belonging to the trichostrongylid nematode family.


Introduction

Trichostrongylid nematodes are primarily parasites of herbivorous animals, but may at times infect humans.¹ Nematodes belonging to the trichostrongylid family that have been recorded as the cause of human infection include Trichostrongylus species, Mecistocirrus digitalis, Haemonchus contortus, Ostertagia circumcincta, Marshallagia marshalli and Nematodirus abnormalis.² Risk factors for infection are close contact with ruminants, the eating of unwashed and uncooked vegetables and the handling of dung.³,⁴,⁵ The eggs and ensheathed filariform larvae of trichostrongylid nematodes are highly resistant to desiccation.¹,⁶ The helminth may be transmitted by ingestion of the egg or rhabditiform or filariform larvae.² Some texts suggest that transdermal infection may occur with filariform larvae,⁵ but attempts to produce infection in man by this route in the laboratory have been unsuccessful.⁶ Eggs of trichostrongylid nematodes resemble closely those of hookworms. The former eggs are however larger (average 73-94 µm in length by 40-50 µm in width),⁷ cylindrical in shape, and often have a unipolar tapering.⁵,⁷ It should be noted that based on egg morphology alone, only identification to the level of trichostrongylid family is possible. With larval culture techniques it is possible to differentiate these organisms to genus, but not species level. Speciation requires recovery of the adult worm post treatment.² A case of imported trichostrongylidiosis in Tasmania in a refugee from the Sudan has previously been reported.²

Case Report

A 3-year-old child born in a refugee camp in Thailand to parents from Myanmar, presented to the Royal Hobart Hospital Refugee Infectious Diseases Clinic for routine screening two months after immigrating to Australia. The patient was active and well, and had no significant clinical history. Routine
testing showed negative serology for hepatitis B, HIV, schistosomiasis and *Strongyloides stercoralis*. Tests for urea, electrolytes, creatinine, calcium, magnesium, phosphate and liver function were normal. The patient was mildly deficient in vitamin D. A full blood count was performed, which was normal except for a mild eosinophilia (0.52 x10^9/L). Abdominal examination detected no abnormality. Three faecal specimens were taken on consecutive days and submitted for parasite investigations by formalin-ethyl acetate concentration and a modified iron haematoxylin permanent stain. Microscopic examination revealed only scanty cysts of *Giardia intestinalis*. In response to these findings, the patient was treated with tinidazole and a stat dose of 150,000 units of vitamin D. In October, the patient re-presented for follow up to ensure clearance of the *G. intestinalis* infection.

A full blood count taken at this time showed a normal eosinophil level (0.39 x10^9/L). A second series of three unpreserved faecal specimens was collected over three days for parasite investigations. No parasites or parasite eggs were observed in any of the formalin-ethyl acetate preparations. In the permanent stain slide of the second and third specimens, five large modified acid-fast bodies resembling larvated helminth eggs were observed (Figure 1). Four of the eggs were modified acid-fast, but one egg did not retain carbol fuchsin stain. The eggs were long and cylindrical, measuring in size 86-93 μm by 37-41 μm. A number of eggs appeared asymmetrical (Figure 2), whilst others displayed unipolar tapering (Figure 3). These findings prompted repeat formalin-ethyl acetate examinations of the third stool specimen. A small number of eggs were found in the repeat formalin-ethyl acetate concentra-
tion only after thorough examination of many coverslip preparations (Figure 4). The eggs were identified as belonging to a trichostrongylid nematode based upon their size and distinctive shape (Figure 5). No other intestinal parasites were identified. Attempts to culture filiariform larvae by agar plate and Hirada-Mori methods over five days at 30°C were unsuccessful. The patient’s trichostrongylid infection was treated with albendazole. Due to logistical difficulties, it was not possible to perform a twenty-four-hour faecal collection following treatment in order to identify the adult worm.

Discussion

It is notable that no helminth eggs were identified in the first set of the formalin-ethyl acetate concentrates of this patient’s stools and only very small numbers in the second set. In our laboratory, two entire coverslips (a saline and an iodine preparation) are prepared and screened for each faecal concentrate performed. Multiple coverslips (in excess of five) were performed before eggs were seen in the concentrated specimens. This reflects a low degree of parasitism in the patient. Importantly, the presence of helminth eggs was first detected in these specimens due to their modified acid-fast nature upon permanent stain preparation. Permanently stained slides allow the scanning of a greater amount of faecal material than is present in a two-coverslip wet preparation from a formalin-ethyl acetate concentration pellet. Thus, important parasites may on occasion be identified in these slides which were not detected in wet preparations of faecal concentrates. This further reflects the usefulness of incorporating a modified acid-fast procedure into a routine parasitic permanent stain, and the fact that doing so may assist beyond the identification of coccidian parasites. Attempts to culture the filiariform larvae were unsuccessful. Some trichostrongylid nematodes are quite resistant to cold, but others may succumb to temperatures such as those achieved in refrigeration.11 As the specimen concerned had been refrigerated for over a week at the time that culture was attempted, and recovery of live larvae was unlikely. Only one of the eggs observed displayed any distinguishable degree of unipolar tapering (Figure 3). The asymmetrical shape observed in some eggs was reminiscent in shape of Enterobius vermicularis but the eggs were far too large to be of this species. Also considered was the mouse pinworm Syphacia obvelata, which has once been recorded infecting a human.10 However, the eggs were too small and insufficiently fusiform in shape to be of this species. The very large size and hookworm-like morphology of these eggs excludes all nematode parasites known to infect humans other than Ternidens deminutus.9 T. deminutus is almost exclusively found infecting humans in Southern Africa.12 Whilst this nematode infection does occur in monkeys in Asia, it has only once been reported as infecting man there.13 One would expect to see much wider eggs if T. deminutus were responsible for this infection. Another possibility considered was that the eggs might be those of the root-knot nematode, Meloidogyne sp., eggs of which can pass through the human intestinal tract as “transit eggs.” The earlier recoveries were very suggestive of this in both shape and size. However, the tapering end and long, cylindrical shape of the egg recovered in the final repeat specimen (figure 3) is very suggestive of a diagnosis of trichostrongyliasis. Trichostrongylid eggs are not larvated on passage.4,5 This case report describes a possible trichostrongylid nematode infection in a young refugee from Myanmar. Deformity of the egg made a specific identification difficult initially, and repeat stool examinations were necessary before an identifiable egg was recovered. This case serves to possibly extend the known geographic range of human infection with trichostrongylid nematodes, and to exemplify the usefulness of performing a permanently-stained slide with an incorporated modified acid-fast stain procedure during all intestinal parasite investigations; without which, this infection would not have been detected. The report also emphasizes the difficulties that may arise in identifying nematode eggs in human faeces.4

Conclusion

The fact that eggs were not seen at this time may be either due to the low numbers of eggs being shed into the faeces, or because the worms present had not reached maturity. Whilst this eosinophilia was not observed in the white cell count performed in October, eosinophilia in trichostrongylid infections is known to be transient.14

References


*Corresponding author

Richard S. Bradbury
Department of Microbiology and Infectious Diseases, Royal Hobart Hospital, Liverpool Street, Hobart, Tasmania, Australia
Email: rbradbur@utas.edu.au

Figure 5 An example of an egg recovered from a known Trichostrongylus infection in Africa for comparison to Figure 3

Photograph: Emeritus Professor John Goldsmid
CASE REPORT

A Case of Intestinal Myiasis – Fact or Fiction?

Richard S. Bradbury,1,2

1 Department of Microbiology and Infectious Diseases, Royal Hobart Hospital, Hobart, Tasmania, Australia
2 School of Medicine, University of Tasmania, Hobart, Tasmania, Australia

ABSTRACT

Intestinal myiasis is the infestation of the human intestine with dipterous (fly) larvae. In the case reported herein, a preserved faecal sample from a nine-year-old African refugee living in Tasmania, Australia, was submitted for routine parasitological screening. The specimen was found to contain fly larvae, identified as belonging to the common bluebottle fly, Calliphora vicina, a common species in Tasmania. It is unknown if this case was a facultative myiasis or a pseudomyiasis. This case demonstrates the difficulties inherent in the differentiation of true intestinal myiasis and pseudomyiasis.


Introduction

Myiasis is defined as, “The infestation of live human and vertebrate animals with dipterous larvae, which, at least for a certain period, feed on the host’s dead or living tissues, liquid body substances, or ingested food”;1 and may be sanguinivorous, dermal/sub-dermal, nasopharyngeal, intestinal or urogenital in presentation.1 Intestinal myiasis occurs when an individual ingests eggs or larvae of flies with food or water. This may occur through consumption of food upon which flies have laid their eggs,2 water in which eggs are present,3 or by flies laying eggs around the mouth following attraction by residual food in that area.4 In some cases, flies may lay eggs around the anus during outside defecation or whilst sleeping naked, which may then hatch and enter the anus and colon.2 Whilst most eggs and larvae are thought to be destroyed by the acidity of the stomach and digestive juices, some may pass through to the intestinal tract, where they go through development until passage.5,6 A large number of fly species have been implicated as causing intestinal myiasis, and the condition is seen worldwide, but is more commonly seen in tropical countries.7 It is commonly reported in babies and small children, which is reflective of their generally poorer hygiene and often adventurous diet.8 Achlorhydria is a predisposing factor9, and intestinal myiasis is more commonly seen in communities with poor socio-economic status, sanitation and nutritional status.6,10

Case Report

A nine year old, male, newly arrived African refugee attended a refugee infectious diseases screening clinic at the Royal Hobart Hospital in Tasmania, Australia. The patient was clinically well and had no obvious underlying pathologies, including no malnutrition or achlorhydria. Three sodium acetate formalin (SAF) preserved stools for routine parasitological examination were collected from the child over three consecutive days and submitted to the hospital laboratory for parasitological examination. The stool specimens were preserved in SAF by the parents of the patient shortly after passage. Upon preparation of the gross specimens for formal-ethyl acetate concentration, a laboratory worker noted a number of small white “worms” were present in the third specimen. These “worms” were removed from the sample and further identified as dipterous larvae. The bodies of the larvae had shrunk away from the integument due to preservation in SAF, but their morphology was well preserved. Observation of the morphology of the posterior respiratory peritremes under a dissecting microscope showed these to be third instar (fully developed) larvae, as three respiratory slits were present (Figure 1).1 The morphology and position of the larval cephaloskeleton (Figure 2), posterior peritremes, integument, posterior segment tubercles and anal tubercles (Figure 3) allowed identification of these larvae as being those of Calliphora vicina, the common bluebottle fly. This species of fly has previously been reported as a cause of accidental intestinal myiasis in humans.1

Discussion

Clinically, gastrointestinal myiasis may present as a spectrum of symptoms from asymptomatic shedding of larvae through to dysentery.5,6 Nausea, haematemesis, vomiting and diarrhea have all been recorded,5,6,10 as has associated anal pruritis.5,9 The severity of symptoms appears to be proportional to the number of eggs ingested, and the placement of larvae within the gastrointestinal tract.5 Patton classified myiasis into three types.11 Obligatory (specific) myiasis describes infestation of the host with fly larvae that are ob-
ligate parasites of living tissue. Facultative (semi-specific) myiasis describes infestation of the host with flies that usually deposit their eggs on decaying flesh or vegetable matter, but act as facultative parasites. Pseudomyiasis (accidental myiasis) describes cases where fly larvae accidentally gain entrance to the living host through contaminated food material and pass through the intestinal tract, but do not develop within the host.

It is important when dealing with a suspected case of intestinal myiasis to differentiate between a facultative myiasis, where larvae survive and develop in the gastrointestinal tract and developed or partially developed larvae are passed, and a pseudo-myiasis, where dead larvae pass through the alimentary canal, or where eggs are deposited on faeces after passage. No flies cause obligatory intestinal myiasis in man. A diagnosis of facultative myiasis is dependent upon observing the presence of live larvae in the stool at passage. Furthermore, in order to diagnose facultative myiasis, it is preferable that multiple developmental stages of larvae are demonstrated and passed in multiple stool specimens. A definitive diagnosis may be made by observation of live larvae in situ via sigmoidoscopy.

Identification of the fly species responsible for any case of true myiasis is recommended. It may be based upon the morphology of the third instar larva. However, it is preferable to raise the larvae to adulthood and identify the mature fly. In this case, due to the preservation of the specimen, identification could only be made on a morphological basis. In some cases chemotherapy has been given for intestinal myiasis. In practice, it is more useful to eliminate potential sources of larval infestation from the diet. Education regarding sanitation, covering and refrigeration of food, washing of food prior to consumption and adequate cooking are sufficient to eliminate intestinal myiasis.

It is unknown if this case was due to the transient passage of dead larvae (pseudomyiasis), or if the larvae were still living upon passage and had developed within the intestinal tract (facultative myiasis). C. vicina takes 48 hours to reach the third instar at 27°C with 50% humidity. Therefore, in our patient, the presence of third instar larvae in a preserved stool specimen strongly indicated that this was a facultative myiasis. However, larvae were recovered from only one stool specimen, and all were at an identical stage of development. Therefore, pseudomyiasis following the ingestion of third instar larvae cannot be excluded.

Conclusion
It could not be determined if this case represented a true facultative myiasis or a pseudomyiasis. This case serves to further inform clinicians and laboratory staff of the existence of intestinal myiasis as a clinical entity, the difficulties inherent in its diagnosis, and the need carefully to investigate any cases where fly larvae are recovered in a patient’s stools.

Acknowledgements
The author would like to acknowledge the assistance of Emeritus Professor John Goldsmid, Dr. Sanchia Warren and Dr. Louise Cooley in providing advice and clinical details during the preparation of this manuscript.

References

Corresponding author
Richard S. Bradbury
Department of Microbiology and Infectious Diseases, Royal Hobart Hospital, Liverpool Street, Hobart, Tasmania, Australia
Email: rbradbur@utas.edu.au
CASE SERIES

Delusional Parasitosis: Case Series and a Review of the Literature

John Frean
National Institute for Communicable Diseases, National Health Laboratory Service, and University of the Witwatersrand, Johannesburg, South Africa

ABSTRACT

Persons with delusional parasitosis are falsely convinced that they are infected with parasites or other pathogens. Primary delusional parasitosis is a form of monosymptomatic hypochondriacal psychosis; these patients are generally otherwise mentally intact. Alternatively, the condition may be secondary to psychiatric or other diseases. Unless it is recognised, the syndrome may be inappropriately managed, and underlying psychiatric or medical conditions may be missed. Treatment of primary delusional parasitosis is notoriously difficult, but newer atypical antipsychotic drugs have improved the outlook for these patients. Five case reports and a brief review are presented.


Introduction

The subject of Delusional Parasitosis (DP) invariably provides interesting and sometimes bizarre medical anecdotes, but for patients and caregivers it is a serious clinical problem. Failure to recognise delusional parasitosis can cause consumption of much time and financial resources, and needlessly prolong distress and frustration of both doctor and patient. This article aims to provide an overview of the condition for medical and allied professionals to enable them to recognise and manage these individuals appropriately, and avoid missing or delaying diagnosis of underlying psychiatric or organic disease; it is an expanded version of a scientific letter published elsewhere.1 Delusional parasitosis (or delusions of parasitosis, Ekbom syndrome, psychogenic parasitosis, chronic tactile hallucinosis, and other terms) is a false but unshakable belief held by affected persons that they are infected by ecto- or endoparasites or other pathogens; that is, ‘bugs’ of some sort.2-4 Some recent literature has suggested that this condition is increasing in frequency,3 and our impression is similar.

Case 1

The subject, a 50-year-old male teacher, travelled from his home in Israel to South Africa for the specific purpose of obtaining parasitological advice for his condition. He ascribed his infection as resulting from exposure to a damp water cistern in northern Israel in 2001, and suspected he was parasitized by ‘giant schistosomes’. Initial symptoms were itching of the anal area and skin of lower back; later, itching of the scalp, nostrils, eyes and ears developed, and objects described as small brown, black and red sand-like particles appeared from nose, eyes and scalp. He observed grey ‘slug-like’ objects in the stool. Over several years the objects increased in size and frequency. Together with a large collection of specimens, he provided a detailed written description of his condition, concluding:

‘Objects out of nose (20-30 per day), in stool (up to 14 cm - 50 to 100 in every movement), muscle weakness, pain in back, red spots on skin, black spots all over back, liquid secretion from anus, ringing and deafness in ears, diminished eyesight, general weakness, hot, sweaty, stiff, painful neck.’

None of the specimens he provided showed evidence of parasitic structures on macroscopic or microscopic examination.

Case 2

The patient was a 58-year-old married woman with a 3-year history of being convinced she was infested with some infective agent or parasite. She complains of small black ‘bugs’ that she could feel entering her skin and causing such painful bites that she could not sit down at work. She described the sensation as being like a sting or ‘small shock’ that made her jerk, and claimed they caused bleeding and scars. In addition to their causing the cutaneous manifestations, she believed they were also visible in bedding, clothing, and her hair. Washing and disinfecting sheets and surfaces improved the situation but the problem never disappeared. The patient ascribed the onset of the infestation to the couple’s visit to the George/Knysna area of the Western Cape Province in South Africa, at which time she believed ‘something alien’ entered their car. She claimed that subsequently her whole life changed: the couple sold their new car, moved house, and disposed of their pets, but to no avail. Her husband said that he shared her belief but was less affected. She consented to get psychiatric help and was assessed as delusional but not psychotic, without any mood disorder. She complied with treatment with olanzapine (Zyprexa) and behavioural modification therapy for 3 months; her husband also attended these sessions. Psychiatric intervention ultimately had no effect; on follow-up a year later she had separated from her husband and according to him, had got worse to the extent that he wondered whether she might need certification as mentally ill.

Case 3

This was a married, well-educated woman in her late fifties who claimed to have a parasitic infestation of the skin. She believed that this was acquired from their house, possibly during disruption caused by building alterations. The infesting ‘things’ were in her hair and skin, and she routinely saw them on furniture, and floors and walls. Their presence was not confined to her own house, and during the office consultation she pointed them out on the furniture and tried to smother them with skin cream and to dig them out of the upholstery with scissors. The patient shaved her hair short and applied a variety of anti-lice medications, as well as other substances including vinegar, to her skin and hair. There was evidence of widespread skin irritation, abrasions and excoriation. The patient brought a large collection of containers (Figure 1) holding the ‘parasites’ she had collected from her skin and hair. The items consisted of skin scrapings and crusts, sebaceous material, and non-specific household debris. She had consulted numerous general practitioners, dermatologists, and specialist physicians, and she had been referred for psychiatric opinion. She was generally non-compliant and refractory to advice; she expressed anger when her beliefs were challenged. Her husband declared his support for her infestation theories but was clearly ambivalent.

Case 4

A 49-year-old employed woman said that she had developed a skin irritation, with ulceration, healing and breakdown, several months before the consultation. She claimed to see larvae and eggs being shed in the form of black granules in the skin lesions. On the basis of information obtained from internet websites she believed emphatically that these were springtail insects (species of collembolans) or mites, possibly carrying a fungus. She had previously consulted a ‘natural scientist’, who claimed to have seen something (a ‘red parasite with one antenna’) hatch from a skin sample over an 8-hour period. The patient believed that her house and bed were infested and had had her cat euthanased. She had applied numerous insecticides, disinfectants and chemicals including ammonia, to her skin, and had consulted several medical practitioners and dermatologists. She said that her sister had the same condition, and that several work colleagues had also developed the same symptoms. An occupational health practitioner arranged for a skin biopsy to be done; the histopathology report noted no evidence of foreign bodies or parasitic or fungal infection; there was marked elastosis, and features of chronic irritation and repair, with a variable chronic inflammatory cell infiltrate. The assessment was that of ‘dermatitis artefaca’; that is, self-induced injury.

Case 5

The patient, a 43-year-old financial professional, had consulted many practitioners; she was well-groomed and well-dressed, intelligent, and extremely articulate, and rejected any suggestion of hers being a psychiatric condition. She believed that she was infected with various parasites, including one found in the Amazon jungle, and that she had been infected via sexual intercourse with an ex-boyfriend, who had acquired the condition in Egypt.
There are 3 forms of DP: 2 primary DP, when the delusion is the only evidence. These parasites then exited the skin, in many places, especially her colon; nutritional deficiencies (B12, folate, thiamine); and a miscellaneous category of diseases (arthritis, hepatitis, vitiligo). Drugs or toxins that have been implicated include alcohol, amphetamines, and cocaine, and amongst medicines are corticosteroids and ketoconazole.2-4

Older names (e.g. acaraphobia, dermatophobia) are misleading because the condition is not a phobia; patients are not irrationally scared of insects or microorganisms. Primary DP is a delusional disorder of the somatic type, that is, that the person has some physical defect of general medical condition. This distinguishes it from, for example, persecutory or grandiose delusions.

Clinical Presentation
The case reports above provide a sample of the range of beliefs that accompany these patients to the consultation. Typically, they appear outwardly normal (until they describe what they believe is their condition). The majority are middle-aged women (overall, the female-to-male ratio is about 2-3:1, but about 1.4:1 for those less than 50 years of age), and often well-educated; social isolation is frequent but not always the case. Younger patients are more likely to have DP secondary to medical conditions, schizophrenia, or substance abuse.2 The delusion frequently involves skin infestation by parasites or other organisms (such as in cases 1-4), or intestinal or other internal worms or other pathogens (case 5). Other sites frequently involved are body openings and their surrounds. Patients may describe elaborate and unlikely life cycles and migration of organisms through the body (cases 4 and 5), and their avoidance of detection by hiding in the body, or (as in case 3) in inanimate objects or the environment. Pets may be implicated as sources of infection and be euthenased or otherwise disposed of by the sufferer (cases 2 and 4). The patient may produce copious notes or diaries documenting their disorder (case 1). Frequently, the internet has been consulted (case 4); there are many websites, legitimate or not, that feed the beliefs of these patients. Some are conspiracy theory websites that claim there are unseen epidemics of parasites invading the population, and naturally reinforce sufferers’ delusions.

Physical symptoms may involve sensations of skin penetration or burrowing by the parasites, and the patient’s attempts to extract them can lead to skin damage, and further irritation. Likewise, application of detergents and chemicals (which may include astringents, bleach, pesticides, paraffin, and others) can cause damage and irritation (cases 3 and 4). The predominance of skin involvement usually entails consultation with dermatologists, among other specialists, during the course of the illness.7 In others, the eyes may be a focus of the delusion, and self-inflicted ocular damage may be a feature.8 The patient usually describes the infection as persistent and unresponsive to numerous treatments, and frequently demonstrates resentment at the ignorance and incompetence of medical practitioners. Rarely, this anger has resulted in attempted murder, and in one case, actual murder of a doctor by a patient with DP.9 Occasionally, too, patients may endanger their own lives in trying to rid themselves of their affliction; Hunt & Blacker described a case
Management of Delusional Parasitosis

Doctors who are not aware of the condition are frequently confused and frustrated by the failure of their usual diagnostic and therapeutic approach. This perpetuates the patients’ beliefs in the intractable nature of their condition, and typically leads to a succession of unsatisfactory consultations. The diagnosis of DP is usually self-evident, even on telephonic consultation, to the knowledgeable practitioner. However, bizarre as they may seem, the patient’s claims must be investigated to exclude the possibility of genuine infection or infestation, and to check for underlying disease that may be the cause of the symptoms. Scabies or infections with animal or bird mites, fleas or lice, contact dermatitis or allergies, or other forms of skin irritation, or, in the case of perceived internal parasites, intestinal worms, could be involved. A medical history and full examination, and appropriate laboratory investigations, are necessary. The latter might include skin scrapings or biopsies, full blood count, blood chemistry, thyroid function tests, or vitamin B₁₂ levels.

A diverse range of medical and psychiatric causes of secondary DP need to be considered, as mentioned above, and referral to specialist physicians, dermatologists, or psychiatrists may be necessary.

Some cases of apparent DP turn out to be simple misinterpretation by the patient of circumstantial evidence. For example, we have seen patients claiming to be passing worms or insects in the urine or stool; on investigation these were identified as, respectively, midge larvae, rat-tailed maggots (*Eratistis tenax* larvae), or ants, originating in or around the urinary or toilet bowl (Figure 2). Artefacts that resemble stool parasites include undigested or transformed vegetable matter. Specimens produced by the patient should be examined to check for the presence of genuine pathogens - the attention of an experienced parasitologist or entomologist will help this aspect greatly. Patients with genuine DP, however, are typically not reassured that the laboratory examinations are negative, and, in fact, these findings paradoxically reinforce their beliefs. Treatment of underlying disease - physical, psychiatric, toxic or other - frequently eliminates or ameliorates secondary DP. The attitude of the doctor is important in managing primary DP.

As mentioned previously, dissatisfaction and resentment characterise the patients’ dealings with doctors, and they fiercely reject the suggestion that there may be a psychiatric basis to their problem. It is suggested that the medical practitioner neither supports nor contradicts the patient’s assertions, but strives to form a cooperative bond with him or her, with the understanding that their discomfort is very real to them. Proper psychiatric assessment is needed to confirm the diagnosis, but patients typically resist referral and, often, the doctor-patient relationship terminates abruptly at the suggestion. A patient may accept antipsychotic medication to reduce stress and anxiety (the term ‘chemical imbalance’ may appeal to the patient), and to help them live with their condition. Antipsychotic medication used for treating DP is pimozide or, preferably, because of fewer extrapyramidal and other side effects, never atypical antipsychotics like risperidone, olanzapine or others.

Prognosis
Before the advent of neuroleptic medication, DP was regarded as a progressive illness, with a small (10-30%) rate of spontaneous remission. The success rate of antipsychotic treatment ranges from 50 to 90%, inversely related to duration of illness. Some patients respond well but never achieve full remission; in others, unfortunately, despite treatment the outcome is sometimes tragic.

References

Corresponding author
John Frean
National Institute for Communicable Diseases, National Health Laboratory Service, and University of the Witwatersrand, Johannesburg, South Africa
Email: johnf@nicd.ac.za

Vol. 11 No.1

ANNALS OF THE ACTM

23
Morphological Observations on Pentatrichomonas hominis, Enteromonas hominis and Rodentolepis nana

Richard S. Bradbury,1,2* Carol R. Males1 and Alan Thomas1
1 Department of Microbiology and Infectious Diseases, Royal Hobart Hospital, Hobart, Tasmania, Australia
2 School of Medicine and Menzies Research Institute, University of Tasmania, Hobart, Tasmania, Australia

ABSTRACT
The Royal Hobart Hospital is the Tasmanian state reference centre for Parasitology. In this capacity, it receives a large number of specimens for parasitic investigations on an annual basis. The experiences gained in morphological observations of a number of parasites have been great, and this short report is intended to convey such experiences with regard to three specific intestinal parasites, these being Pentatrichomonas hominis, Enteromonas hominis and Rodentolepis nana.


Introduction
Beginning in 2002, Tasmania has become the new home for many refugees, predominantly from Sudan and Sierra Leone and Myanmar; though a small number are emigrants from other African, Middle Eastern and Asian countries. This has resulted in the presentation of a number of unusual parasitic infections at the RHH Microbiology laboratories. Included in these presentations have been examples of infection with the commensal protozoa; E. hominis and P. hominis. Whilst these organisms are harmless to the human host, they are not normal gut flora, and their presence signifies exposure to faecally contaminated water or food. It is therefore important that these organisms be reported when observed in clinical laboratories, as they may act as sentinels for more infections with pathogenic parasites also spread by the faecal-oral route. Giardia intestinalis will often be shed intermittently in patient’s faeces, with more than five stool specimens requiring examination prior to detection of infection.1 The presence of commensal protozoa transmitted via the same route may therefore alert the treating physician to continue investigations for pathogenic organisms, despite there being undetected in the submitted stool specimen.

A large number of cases of infection with the intestinal cestode; R. nana (formerly Hymenolepis nana) have also been reported in this refugee population. R. nana is a verified pathogen in humans. The clinical presentation of symptoms is worm burden dependent, and infection may be asymptomatic or present with symptoms of anorexia, abdominal pain and diarrhoea1.

Methods
Faecal Concentration
Three separate Sodium-acetate Acetic-acid Formalin (Para-Pak SAF - Meridian Bioscience, Cincinnati, OH) preserved faecal samples were collected from each patient and submitted for parasitological investigation to the Microbiology Laboratory, RHH. Specimens were homogenised and 2-5 mL (depending on viscosity) of each added to separate plastic Evergreen faecal concentrate tubes (Evergreen, Los Angeles, CA) This volume was made up to 10 mL with Sterile saline then tube capped and mixed. Tubes were centrifuged at 500g for 10 minutes and the excess supernatant discarded. Smears for permanent staining (Table 1) were prepared by mixing one drop of the sediment with approximately ½ drop of Mayer’s albumin (Meridian Bioscience, Cincinnati, OH) on a glass microscope slide. These slides were then allowed to air dry for at least 10 min. Prepared smears were stained using the modified iron-haematoxylin method described in Table 1. A commercial protozoan control slide (Remel, Lenexa, KS) and in-house prepared Cryptosporidium species control slide was included in each batch of slides stained. Microscopy of the permanent smear at x1000 (bright light) was performed using the “battlements” method.

Results and Discussion
The human commensal flagellate protozoan; P. hominis (Figure 2) is easily identified by its distinctly pyriform shape, round nucleus, anterior flagella and distinct pointed axostyle, which extends beyond the posterior end.2 In saline preparations, the trophozoites have a distinctive jerky motility, often described as resembling a “man trapped in a plastic bag”. This protozoan is uncommon, and stains poorly in permanent stains,3 and thus is often overlooked when present. No cyst stage of this organism exists.3

---

Table 1 Modified Iron Haematoxylin Parasite Stain

<table>
<thead>
<tr>
<th>STEP</th>
<th>TIME</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5 min</td>
<td>70% Ethanol</td>
</tr>
<tr>
<td>2</td>
<td>2 min</td>
<td>Running tap water wash</td>
</tr>
<tr>
<td>3</td>
<td>1 min</td>
<td>Strong Carbol Fuchsin</td>
</tr>
<tr>
<td>4</td>
<td>1 min</td>
<td>Running tap water wash</td>
</tr>
<tr>
<td>5</td>
<td>8 min</td>
<td>Iron Haematoxylin working solution</td>
</tr>
<tr>
<td>6</td>
<td>1 min</td>
<td>Distilled water wash</td>
</tr>
<tr>
<td>7</td>
<td>4 min</td>
<td>5% Acetic Acid</td>
</tr>
<tr>
<td>8</td>
<td>5 min</td>
<td>Running tap water wash</td>
</tr>
<tr>
<td>9</td>
<td>3 min</td>
<td>70% Ethanol/Ammonia</td>
</tr>
<tr>
<td>10</td>
<td>5 min</td>
<td>95% Ethanol</td>
</tr>
<tr>
<td>11</td>
<td>5 min</td>
<td>100% Ethanol</td>
</tr>
<tr>
<td>12</td>
<td>5 min</td>
<td>Fresh 100% Ethanol</td>
</tr>
<tr>
<td>13</td>
<td>5 min</td>
<td>Xylene</td>
</tr>
<tr>
<td>14</td>
<td>5 min</td>
<td>Fresh Xylene</td>
</tr>
<tr>
<td>15</td>
<td>-</td>
<td>Mount slide</td>
</tr>
</tbody>
</table>

Method employed by the Microbiology department of the Royal Hobart Hospital (strong carbol fuchsin and iron-haematoxylin stains are prepared in-house)

Figure 1 Trophozoites Pentatrichomonas hominis
The commensal protozoan *E. hominis* (Figure 3) morphologically resembles *Endolimax nana*. These two organisms may be differentiated by the smaller size of *E. hominis* compared to *E. nana* (with marked size overlap). Cysts of *E. hominis* are usually 6-8 μm by 4-6 μm, whilst trophozoites usually measure 3-6 μm by 4-10 μm. Trophozoites of *E. hominis* possess a distinctive finely vacuolated cytoplasm. There is a predominance of binucleate forms (note that uninucleate and quadrinucleate forms are seen), and trophozoites often taper to a point at one end. The authors have also noted when observing *E. hominis* that the nuclei appear smaller than those of *E. nana* and that the trophozoites are more “amoeboid” in appearance (having a greater numbers of cytoplasmic blebs and protuberances than are seen in the trophozoites of *E. nana*). It is suggested that human colonisation with this organism is under-reported, due to its misidentification as *E. nana*.

During the course of this work, an observation was made regarding the modified acid fast nature of the oncosphere of *R. nana* eggs (Figures 3, 4). This previously unreported phenomenon is universally observed in eggs of this species when stained with the modified iron-haematoxylin stain method. This observation lends itself to improved screening for *R. nana* in faeces for epidemiological studies. As few normal elements of faeces are modified acid fast, screening for *R. nana* eggs could be performed by preparing a thick smear of faeces and staining with a modified acid fast stain, followed by microscopic screening on low power for the modified acid fast oncosphere of these eggs. Such a method; when performed on concentrated faecal samples; would allow a higher sensitivity than a faecal concentration technique followed by screening of two microscope cover-slips alone.

**References**


*Corresponding author*

Richard S. Bradbury

Department of Microbiology and Infectious Diseases, Royal Hobart Hospital, Liverpool Street, Hobart, Tasmania, Australia

Email: rbradbur@utas.edu.au
On 14 November 2009, the College Council of The Australasian College of Tropical Medicine established a Sub-Faculty of Expedition Medicine within the Faculty of Travel Medicine. There is increasing interest in expedition medicine in Australasia, reflected by the development of various professional, academic and commercial educational programs in expedition and wilderness medicine in both Australia and New Zealand. The burgeoning commercial expedition industry, as well as the many scientific, professional, school, and other community expeditions that are conducted each year, require expertise and support from the field of expedition medicine.

Expedition medicine, known in North America as ‘wilderness medicine’, has been described as one of the four important areas of travel medicine with other areas being prevention of travel related disorders (through advice, vaccination and prophylaxis), insurance medicine and retrieval medicine. The Oxford Handbook of Expedition and Wilderness Medicine defines the field of expedition medicine as being:

"concerned with maintaining physical and psychological health under the stresses and challenges of expeditions. Its aim is to encourage adventure but to attempt to minimise the risk of trauma and disease by proper planning, preventive measures such as vaccinations, sensible behaviour and acquisition of relevant medical skills. Responsible attitudes towards the environment and the welfare of the indigenous peoples in the areas of travel are also of great importance."2

The Sub-Faculty of Expedition Medicine therefore has natural synergies with its host Faculty, the Faculty of Travel Medicine of the College. The Faculty will be officially launched at the upcoming College conference celebrating “100 Years of Tropical Medicine”, being held in Townsville from 11-14 June 2010.

Sub-Faculty membership will be drawn predominantly, but not necessarily exclusively, from generalists and specialists in the medical, nursing and paramedical professions in the private and public sectors. The Sub-Faculty is actively seeking to encourage membership amongst those working in expedition and wilderness medicine and provides professional recognition through different grades of membership, which reflect the level of training and experience of applicants, as well as their commitment to continuing education. Professional grades of membership include Fellow, Associate Fellow, and Member of the Faculty of Travel Medicine endorsed in Expedi-
tion Medicine with relevant post-nominals being FFM (Exped Med), AFFTM (Exped Med) and MFTM (Exped Med). College affiliation is currently required to become a member of the Sub-Faculty of Expedition Medicine. A Professional Organization Profile will be published shortly in Travel Medicine and Infectious Disease.3

Further information may also be obtained by contacting The Executive Officer, ACTM Secretariat, AMA House, P.O. Box 123, Red Hill, Queensland, 4059, Australia. Telephone: +61-7-3872-2246; Fax: +61-7-3856-4727; Email: actm@tropmed.org

References
3. Leggat PA, Shaw MTM. Professional Organisation Profile: A Sub-Faculty of Expedition Medicine for Australasia. Travel Med Inf Dis (in Press).

*Corresponding author
Peter A. Leggat
School of Public Health, Tropical Medicine and Rehabilitation Sciences, James Cook University, Townsville, Queensland, Australia
Email: peter.leggat@jcu.edu.au

Interests to Declare: Both authors are Council Members of The Australasian College of Tropical Medicine. The first author is also Interim Chair of the Sub-Faculty of Travel Medicine.
ANNOUNCEMENT

AIMS Tropical Division / ACTM and Partners

25th Annual North Queensland Conference / 19th Annual ACTM Scientific Meeting
11th to 14th June 2010

100 Years of Tropical Medicine
Call for Abstracts and Registration now Open

The Organising Committee warmly invites you to attend our 25th Annual Conference to be held from 11th to 14th June 2010 at The Townsville Entertainment and Convention Centre and Jupiter’s Hotel & Casino.

Professional Partners to Date:
- The Australasian College of Tropical Medicine (ACTM)
- North Queensland Centre for Cancer Research (NQCCR)
- Histotechnology Group of Queensland
- Australian Association of Clinical Biochemists (AACB)
- Australian Phlebotomy Association
- Australian Society of Microbiology
- James Cook University
- Queensland Health

Contact: David Porter  Phone: +61-7-4796-2400 or Email: david_porter@health.qld.gov.au  Web: http://aims.iamevents.com.au/index.php
INSTRUCTIONS FOR AUTHORS

The format of the Annals of the ACTM will, in general, follow guidelines of the “Uniform requirements for manuscripts submitted to biomedical journals” and published by the International Committee of Medical Journal Editors (http://www.icmje.org/index.html).

The Annals will appear twice a year and will consider for publication, papers on a wide range of topics relating to tropical and travel medicine. All papers will be refereed prior to acceptance for publication. Papers will be included in one of the following categories:

a) Review Articles (5,000-10,000 words)
b) Research Articles (up to 5,000 words)
c) Case Reports (1,000-2,000 words)
d) Research Reports (1,000-2,000 words)
e) Letters (200-500 words)

Figures to be included: 1/4 page size = 250 words; 1/2 page size = 500 words etc. One page with images is approximately 900 words, two pages with image is approximately 1,800 words. Manuscripts should be double spaced and a short summary should be included at the beginning of the paper after the title and author details. Title page with contributor names and addresses should be on a separate page. Each table and figure should be on a separate page together with an appropriate caption, explanatory notes etc. Any acknowledgements should be included at the end of the paper before the references. Where appropriate, authors must confirm in the paper that experimental procedures on humans and animals conformed to accepted international ethical guidelines. References should be numbered consecutively in order of first appearance in the text. For details of references, consult the “Uniform requirements for manuscripts submitted to biomedical journals” available at http://www.icmje.org/index.html.

In the first instance, papers submitted for consideration should be sent to:

The Editorial Board
Annals of the Australasian College of Tropical Medicine
ACTM Secretariat
PO Box 123, Red Hill
Queensland 4059 Australia
Tel: + 61-7-3872-2246
Fax: +61-7-3856-4727
Email: actm@tropmed.org

Statements or opinions in papers published in the Annals of the ACTM are solely those of the authors and not necessarily those of the Editorial Board of The Australasian College of Tropical Medicine. The inclusion of commercial advertising material in the Annals or the College. The College disclaims any responsibility for any injury to persons or property resulting from publishing material or products referred to in articles or advertisements. On acceptance of an article for publication in the Annals, copyright of the article is automatically transferred to the ACTM.