

Science Research and Education in Africa

Science Research and Education in Africa:

*Proceedings of a Conference
on Science Advancement*

Edited by

Alain L. Fymat and Joachim Kapalanga

Cambridge
Scholars
Publishing



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FOREWORD

Not being present at the 2015 International Conference of the Society for the Advancement of Science in Africa (SASA), I cannot hope to use this opportunity to give an authoritative first hand opening perspective to the publication of the Conference Proceedings. But, not being present is also an advantage, as it removes me from any emotional connection and forces me to give an intellectual editorial to the published proceedings and to SASA's endeavors in general. From reviews, the conference evidently featured top quality presentations, with eloquent preliminaries, spirited discussions and intense intellectual engagement of the audience. Among the attendance, a total of 15 senior faculty members, professors and senior scholars gave inspiring and animating presentations, crowning the conference all together. The conference also featured maiden, and successful, Skype presentations by two senior scholars. This is a mechanism that can be developed further and replicated in future conferences to accommodate conference attendance difficulties including economic barriers for young African students/scientists, tight schedules that prevent travel or visa requirement impediments, etc. The quality of the Conference Proceedings is reflected in the proceedings publications. If there were such things as measures for a conference index of informativeness, audience engagement, conference intensity, animation, spirit and/or liveliness, then, without hesitation I would have to say that the score for each index would be over 90%, a verdict reflecting astounding levels of conference success. This can be attributed to the tireless and selfless efforts of the Executive President Professor Joachim Kapalanga, the Scientific Committee chaired by Professor Alain L. Fymat and the foot soldiers of the Local Organizing Committee, spiritedly led by Dr. Francis Akena Adyanga.

The Society for the Advancement of Science has already made its mark on the African scientific and research arenas. SASA was launched by African scientists, researchers and academics around the world as well as in Africa, and participant scientist friends of Africa from the USA, Canada, Europe, China, India, Brazil and Russia. This fraternity of scientists initiated the primordial forms of SASA in 2011, through spirited online discussions and the distilling of ideas that led to the launching of a formal organization

with the name SASA, the slogan “*Pushing the Frontiers of Science in Africa*” and an impressive logo. The launching of SASA was announced in *Nature Journal* in the first three consecutive weeks of January, 2013. SASA was inaugurated and held its First Annual International Scientific Conference under the theme “The Advancement of Science in Africa” on April 25-28, 2013 at the University of Limpopo, South Africa. Following the resounding success of that first conference, SASA held its second such conference in Kampala, Uganda, May 6-9, 2014 under the theme “Science Innovation for Economic Development” that included a joint collaboration colloquium with the Global Knowledge Initiative organization entitled “The African Collaboration Colloquium”. Subsequently, SASA held a hugely successful third Annual International Scientific Conference at the University of Toronto, Toronto, Canada on August 28-September 2, 2015 under the theme “Science Research & Education in Africa”.

SASA is registered as a Not-for-Profit Non-Governmental Organization (NGO) in Canada. It is regionally represented in North America, Africa, Asia and Europe.

SASA’s annual conferences are designed and intended to promote a general culture of science on the African continent in addition to specific individual scholarly activities. Without a well-developed culture of science and scholarly activities, the quality of scientific practice, research, technological advancements and innovation cannot be assured and maintained. SASA defines the culture of science and scholarly activities as competitively participating in high quality research, engaging in effective science education, participation in organizing conferences, attending and presenting at local, regional, national and international conferences, publishing in peer reviewed scientific journals, developing novel and innovative ideas and approaches in research methodology, submitting research data for critical analyses and obtaining research funds by highly competitive grantsmanship and not by being non-competitively selected for an award.

In addition to the annual conference, SASA has spiritedly been developing the Africa Scholar Brain Circulation (ASBC) Program. The ASBC program was premised on the understanding that within the African scientific and research diaspora, and in Africa itself, there are eminent academics with a huge amount of collective scientific and research knowledge. The ASBC program is designed to tap into this knowledge resource. This is how the ASBC program would work: SASA looks around

to obtain the funding for the program and coordinates the program with specific African universities and other academic institutions. Willing diaspora academics would travel to participating institutions (and the SASA Center in the future), to give a two-to-eight week series of lectures and community outreach talks on various and diverse topics, for example, research methodology for nurses, disease epidemics in Africa, community citizen science in Africa in addition to garden-variety type academic lectures at universities and colleges. The ASBC program is not meant to be one-way traffic though. It is designed to circulate brain power. In that regard the other segment of the circulation will involve the travel of African academics in Africa to North American, European or Asian academic institutions to give lectures, for example, on their experiences with Ebola and other epidemics or to learn a new skill and research methodology. Since 2011, the ASBC program has been disseminated extensively to both diaspora and Africa-based scientists, academics and researchers. This extensive and sustained outreach effort by SASA has inspired in its wake various initiatives in Africa and outside of Africa. Many have copied SASA's ideas. Recent initiatives such as the 'Carnegie African Diaspora Fellowship (CADF)' program, started in 2013, and the 'Alliance for Accelerating Excellence in Science in Africa (AAESA)', started in 2015, are notable examples of ideas inspired by the ASBC and/or benchmarked from SASA.

At a visionary level, SASA has been conceptualized as a civil society driven, organized, coordinated, concerted, continent-wide advancement of science in Africa by local, regional, continent-wide and global effort and collaboration. As it continues its mission of promoting a general culture of science on the African continent, SASA is now organizing the fourth such conference in Nairobi, Kenya, August 22-26, 2016 under the theme "Advancing Africa's Sustainable Development through Science, Technology and Innovation". The publication of the 2015 Conference Proceedings is but the first such periodic dissemination of the record of presentation, discussion and exchange of scientific data and perspectives during SASA conferences. It lays a strong foundation on which to build.

To assess the success, impact and effectiveness of a SASA Conference and other events or projects, we need to develop objective instruments for such assessments. One obvious use of such assessments is to compare the success of the annual SASA conferences and even other conferences. The raw statistical data could include:

- Number of attendees;
- Number of abstracts submitted/presented;
- Number of seminars and workshops proposed and effected;
- Number of questions asked after a presentation and whether or not further questions had to be cut off;
- Number of senior faculty members/scholars/professors presenters;
- Number of students presenting;
- Global, regional and country-to-country representations;
- Diversity of abstracts submitted; and
- Any other suggestions.

Therefore, the commitment of all stakeholders towards achieving SASA's set goals and activities is of paramount importance. Rigorous networking and efficient partnerships, as suggested in nearly all the conference papers, are imperatives for moving forward with our common vision for Africa's scientific growth and development. I commend the mentorship, training and science education resourcing and other opportunities SASA networks bring to the African universities, youth, women and scientists. You are leaving significant signatures in the history of Africa's scientific landscape and growth. I would therefore like to call upon all of you to take up the challenges articulated herein to enable Africa to realize her full scientific and economic potential.

Christine Dranzoa, PhD
Deputy Vice Chancellor
Muni University, Arua, Uganda

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We are grateful to the several authors for their contributions to the chapters that follow. We would like to thank the International Institute of Medicine and Science, Rancho Mirage, California, U.S.A. and the Schulich School of Medicine and Dentistry, Western University, Ontario, Canada for their benevolent support in our dedication of time and effort to this project and, more generally, to the advancement of science research and education in Africa. We would also like to thank Professor Angela Hildyard, Vice President of the University of Toronto and Professor Glen Jones, Dean of the Ontario Institute for Studies in Education (OISE) for their warm welcome and hospitality while holding this Conference on their premises. We thank also Professor Njoki Wane and Dr. Francis Akena Adyanga for securing the Conference venue at OISE. Thanks are further due to Dr. Adyanga and his team for the organization of all international and local arrangements that contributed in no small measure to the success of the Conference.

We would further like to thank Professor Catherine A. Odora-Hoppers of the Department of Science and Technology, National Research Foundation, South African Research Institute, University of South Africa; Professor Lucy W. Irungu, Deputy Vice Chancellor (Research, Production and Extension), University of Nairobi, Kenya; Professor David M. Ndeti, Department of Psychiatry, University of Nairobi, Kenya; Professor David W. Dunne, Department of Pathology, University of Cambridge and Director of the Wellcome-Trust-Cambridge Center for Global Health Research, CAPREx, THRIVE-Cambridge and Cambridge-Africa, United Kingdom; Professor P. Balakrishna Shetty, Vice Chancellor, Sri Siddhartha University, Tumkur, India; and Professor (Emeritus) Ronald Laporte, Graduate School of Public Health, University of Pittsburgh U.S.A. for their spirited participation in our deliberations. Special thanks are also due to Professor Emilio Ovuga, Department of Psychiatry, Gulu University, Uganda for his unwavering support, enthusiasm for, and contribution to SASA's vision, mission and objectives.

Finally, we thank the editors at Cambridge Scholars, particularly Ms. Victoria Carruthers and Ms. Amanda Millar, for their support and assistance in this project.

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J.K.

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ABOUT THE EDITORS

DR. ALAIN L. FYMAT, BA, BS, MA, MS, PhD, PhD, is a medical-physical scientist and an educator who was educated at the Universities of Bordeaux and Paris-Sorbonne, France, and the University of California at Los Angeles. He is the current President/CEO and Professor at the International Institute of Medicine & Science with a previous appointment as Executive Vice President, Chief Operating Officer and Professor at the Weil Institute of Critical Care Medicine, both Institutes located in Rancho Mirage, California, U.S.A. He was formerly Professor of Radiology, Radiological Sciences, Radiation Medicine (Oncology), and Physics at several U.S. and European universities (University of California at Los Angeles, University of Southern California and Loma Linda University, California; University of Lille, France). Earlier, he was Deputy Director (Western Region) of the U.S. Department of Veterans Affairs, Veterans Health Administration (Office of Research Oversight). At the Loma Linda Veterans Affairs Medical Center, he was Scientific Director of the Radiology Service, Director of the Magnetic Resonance Imaging Center and, for a time, Acting Chair of Radiology. Previously, he was also Director of the Division of Biomedical and Biobehavioral Research at the University of California at Los Angeles/Charles R. Drew University of Medicine and Science in Los Angeles, California.

In an earlier research career, at the California Institute of Technology (Jet Propulsion Laboratory, a contractor of the U.S. National Aeronautics & Space Administration), Dr. Fymat was actively engaged in atmospheric sciences, the environment, climatology, and space exploration. He was an investigator in several Earth- and space-bound experiments within the U.S. Earth and space exploration program. He was an Advisor to the U.S. National Research Council, National Academy of Sciences for its post-doctoral programs tenable at the Jet Propulsion Laboratory. His industrial experience was in the context of the U.S. Strategic Defense Initiative (Ballistic Missile Defense Program) researching and designing atmospheric probes and electromagnetic sensors operating in benign and stressful nuclear environments.

Dr. Fymat's current research interests lie at the interface between science and medicine (particularly molecular/personal/precision medicine, nanomedicine, and human genetics/epigenetics/ecogenetics). He has been extensively published (well in excess of 300 scholarly publications including patents, books & monographs, book chapters and refereed articles). He has received numerous research grants from government, academia and private industry, and has consulted extensively with these entities. He has lectured extensively in several national and international academic, professional, governmental and industrial venues. He is a member of the Editorial Board of the "Journal of Nanobiotechnology" (an international open online PubMed journal) and an *Honorable* Editor of the "Journal of Cancer Prevention and Current Research" and the "*Journal of Nanomedicine Research*" (international open online Medcrave journals). He is a Board member of several institutions including (Chair: Medical & Technical Advisory Board of Janus Medical Systems Pte, Ltd, Singapore, that develops breakthrough electronic personal and hospital medical records; Health Advisor: American Heart & Stroke Association, Coachella Valley Division, California). He is a past or current Member of several national and international professional societies (International Radiation Commission; American Association of University Professors; American Association of University Radiologists; American College of Radiology; Radiological Society of North America; California Radiological Society; Los Angeles Radiological Society; American Association of Physicists in Medicine; American Institute of Physics).

With interest in Africa, Dr. Fymat is also associated with the Society for the Advancement of Science in Africa - SASA (Vice Chair of the Board; Member of the Executive Council; Director of the Scientific Directorate; Chair of the Scientific Committee; and Chair of the Scientific Programs: 2013 in Polokwane, South Africa; 2014 in Kampala, Uganda; 2015 in Toronto, Canada; and 2016 in Nairobi, Kenya).

DR. JOACHIM KAPALANGA, MD, MSc, PhD is a physician-scientist and an educator who was educated at Yale University, the State University of New York (SUNY), Queens University, McMaster University and the University of Guelph. He is currently Professor (Adjunct) of Pediatrics at Schulich School of Medicine & Dentistry and South Western Ontario Academic Health Research Group & Medical Education Network. He is also a faculty member at McMaster University and a Visiting Professor at Gulu University, Kampala, Uganda. He is also Chief of Pediatrics at the Grey Bruce Health Services, Ontario, and a consultant pediatrician and

medical geneticist at the Summerside Medical Centre (SSMC), Prince Edward Island, (PEI), Canada.

Dr. Kapalanga has held faculty and leadership positions in various institutions and organizations. He was formerly Associate Professor and Head of the Division of Medical Genetics at Upstate Medical University/State University of New York (SUNY), Assistant Professor and Member of the Prince Edward Island (PEI) University and Health Research Institute; Clinical Instructor in Genetics at Yale University; Assistant Clinical Instructor in pathology and pediatrics at SUNY; and Lecturer at Dalhousie University. He was also Chairman of the Perinatal Committee of the SSMC/Prince County Hospital, Head of the PEI Newborn Screening Program, and PEI Representative at the Fetal Alcohol Spectrum Disorder Canadian Expertise (FACE) Research Round table. He was also appointed to the Council, College of Physicians and Surgeons of Prince Edward Island.

Dr. Kapalanga is a Fellow of the American College of Medical Genetics, Fellow of the American Academy of Pediatrics, Diplomate of the American Board of Medical Genetics, Diplomate of the American Board of Pediatrics and an Associate Fellow of the Canadian College of Medical Genetics. He is a member of the American Medical Association, American Society of Human Genetics, FACE Research Roundtable, Canadian Congenital Anomalies Network Surveillance Network, Canadian Medical Association, the Ontario Medical Association and a founding member of the African Society of Human Genetics.

Dr. Kapalanga's current scholarly and research pursuits are in neurodevelopmental and neurobehavioral genetics, in the emerging field of epigenetics and in cancer genetics. He espouses multidisciplinary, multicenter and international research.

With interest in Africa, Dr. Kapalanga is the founder, Chairman of the Board and Executive President of the Society for the Advancement of Science in Africa – SASA.

PREFACE

For various economic and political reasons, it is self-evident that many African countries currently lag behind the rest of the industrialized world in scientific and medical research and development. However, the presence of intellectual islands scattered across the continent gives hope that this is only a transient situation on the cusp of undergoing a profound and beneficial change.

The Society for the Advancement of Science in Africa (SASA) hopes to catalyze and contribute to this much-needed evolution. It must be recognized from the outset that SASA is not, and does not claim to be, one traditional professional society among so many others. It is a Society with the mission to contribute to Africa's economic advancement and sustainability through science research, education and innovation.

During its Inaugural Meeting & First International Conference in Polokwane, Limpopo Province, South Africa, April 25-28, 2013, a total of 75 abstracts submitted for possible presentation were retained (after scientific merit review) from among a larger number of submissions. These contributions originated from African authors and their colleagues and collaborators worldwide. They included scientific papers, posters and workshops. Such a huge response was a testimony to the need for an Africa-wide organization like SASA to channel this creativity and production. It was also an expression of the lively, nascent state of science across the continent. Lastly, it was gratifying for the organizers and a validation of their hopes and aspirations for Africa.

The Second Annual International Conference held in Kampala, Uganda, May 6-10, 2014, likewise continued to augment SASA's participation to the greater African economic development. In its efforts to be economically relevant and practical, the SASA Scientific Committee had embarked on the theme **"Science Innovation for Economic Development"**. It had assembled a program that did not only interest the participants, but provided the spearhead to forge ahead with the deserved economic contributions to local economies. As one illustration of SASA's aims, during that Conference, a one-day joint Collaboration Colloquium was

held with The Global Knowledge Initiative (Washington, D.C.). This latter institution is active in several African countries, including Uganda, at the host University. The Colloquium theme was a case study of harnessing collaborative science and innovation for economic development, technology, training, and innovation in hay-making for youth employment.

The theme of the 2015 Third International Annual Conference, held in Toronto, Canada, August 28-31, 2015, was “**Science Research & Education in Africa**”. It addressed the need to promote the development of science research and education on the African continent. It included several important sub-themes: Improving Health Research and Disease Surveillance Education; Epidemic Diseases with High Mortality; Strengthening Research Training and Project Development; Developing Future Science Education Programs; Indigenous Education from a Global Perspective; Promoting Women's Interest in Science Careers; Fostering Youth Development with Science Education; and Building Inter-Institutional Collaborations. Internationally recognized authorities presented their respective viewpoints within discussion Panels, and several sub-sessions and poster sessions featured scientific presentations. The venue of the Conference was most appropriate as Canada is an important champion and sponsor of several African programs as well as the host of many African students and researchers.

For the benefit of the readers and for completeness, the 'program at-a-glance' listing the key abstracts approved for presentation at the Conference is provided below. However, it should be noted at the outset that for various reasons: financial, political (visa issuance/denial), etc. not all abstracts were presented. Further, for other reasons (rejection/withdrawal of the manuscript submitted, lack of manuscript submission in due time, etc.), only a selection of the presentations can be provided in this volume. Still further, the transcripts of the panel discussions, however interesting in their own right, are also not included.

CONFERENCE PROGRAM AT-A-GLANCE

*** FRIDAY 28 AUGUST 2015 ***

13:00 - 13:10

Welcoming Remarks

Prof. Joachim Kapalanga

SASA Executive President

13:10 – 13:30

Welcoming Address

Prof. Angela Hildyard

Vice President, University of Toronto, Canada

The Challenges of Leadership in the Scientific Community

13:30 – 13:40

Welcoming Address

Prof. Glen Jones

Dean, Ontario Institute for Studies in Education, Toronto, Canada

13:45 – 14:15

Presidential Address

Prof. Joachim Kapalanga

SASA Executive President

Professor (Adj) of Pediatrics, Schulich School of Medicine &
Dentistry and

South Western Ontario Academic Health Network

University of Western Ontario, Canada

**Missionary Science in Africa: A Policy Opinion on
Advancement of Science in Africa**

14:15 - 15:00

Keynote Address

Prof. Catherine A. Odora Hoppers

Department of Science and Technology, National Research
Foundation,

South African Research Initiative (DST/NRF/SARCHI)

University of South Africa

**Science and Technology in Africa: Research Without
Programmes, Scientists Without Communities -
An African Perspective of Knowledge Development and Policy
Reforms**

15:00 – 15:45

Invited Address

Prof. Lucy W. Irungu

Deputy Vice Chancellor (Research, Production and Extension)
University of Nairobi, Kenya

**Best Practices in Integrating University Research, Innovation
and Outreach to Foster National Development**

16:00 – 17:00

PANEL DISCUSSION 1

Research and Education in Africa

Moderator: **Prof. David M. Ndeti**

Professor of Psychiatry, University of Nairobi, Kenya
Founding Director, Africa Mental Health Foundation

Panelists: **Dr. Michaela Hynie, Prof. Lucy W. Irungu, Dr.
Eusebius J. Mukhwana, Prof. Catherine A. Odora Hoppers,
Prof. Njoki Wane**

*** **RECEPTION** ***

19:00 – 21:00

Opening Reception & Welcoming Address

Prof. Njoki Wane

SASA Vice President (North America)
Professor, Ontario Institute for Studies in Education
University of Toronto, Canada

*** **SATURDAY 29 AUGUST 2015** ***

09:00 – 09:45

Keynote Address (Africa)

Prof. David M. Ndeti

Professor of Psychiatry, University of Nairobi, Kenya
Founding Director, Africa Mental Health Foundation

**Building Inter-Institutional Collaboration for Mental Health
Research and Services from Community Level to International
Level – The Kenyan Experience**

09:45 – 10:30

Invited Address

Prof. David W. Dunne

Professor of Parasitology, University of Cambridge
Director, Wellcome-Trust-Cambridge Centre for Global Health
Research

CAPREx, THRIVE – Cambridge & Cambridge - Africa

**Assisting African Universities to Accelerate and Sustain
Progress in sub-Saharan Africa**

10:30 – 11:15

Invited Address

Dr. Eusebius J. Mukhwana

Division of Planning, Research & Development
Commission for University Education, Kenya

**Policies to Support Quality University Teaching and Research
in Kenya**

11:15 – 12:00

Invited Address

Prof. Alain L. Fymat

SASA Vice Chair & Scientific Director and
President/CEO & Professor

International Institute of Medicine and Science, California, U.S.A.

Perspectives on Drug Manufacturing in Africa

13:00 – 16:30

PLENARY SESSION 1

Improving Health Research & Disease Surveillance Education

Session 1: Infectious Diseases

*(Dedicated to the memories of Dr. Matthew Lukwiya and Dr.
Teasdale Corti)*

Moderator: **Prof. Cynthia Maxwell**

Mount Sinai Hospital and University of Toronto, Canada

Session 2: Chronic Diseases

Moderator: **Prof. David Zakus**

Professor of Distinction, Faculty of Community Services
School of Occupational and Public Health
Ryerson University, Toronto, Canada

16:30 – 17:30

PANEL DISCUSSION 2

Health Research & Development in Africa

Moderator: **Prof. Catherine A. Odora Hoppers**

Department of Science and Technology
National Research Foundation

South African Research Initiative (DST/NRF/SARCHI)
University of South Africa

Panelists: **Prof. Emmanuel Abara, Prof. Sam Lanfranco, Prof. Ronald Laporte, Prof. Cynthia Maxwell, Prof. David M. Ndeti, Ms. Akoth Jane Val**

17:30 – 18:30

SASA Business Meeting 2 (Closed)

*** **SUNDAY 30 AUGUST 2015** ***

09:00 – 14:00

PLENARY SESSION 2

Community-Based Research & Education

09:00 – 11:00

Session 3: Community-Based Health Care

Moderator: **Prof. Njoki Wane**

SASA Vice President (North America) and
Professor, Ontario Institute for Studies in Education
University of Toronto, Canada

11:00 – 12:00 and 13:00 – 14:00

Session 4: Social Aspects of Science Education & Research

Moderator: **Prof. Margareth Zanchetta**

Ryerson University, Toronto, Canada

PLENARY SESSION 3
Promoting Women's Interest in Science Careers

14:00 – 15:00

Session 5: Current Status of Women in Science

15:00 – 16:00

PANEL DISCUSSION 3

Women in Science & Technology

Moderator: **Prof. Njoki Wane**

SASA Vice President (North America)

Professor, Ontario Institute for Studies in Education

University of Toronto, Canada

Panelists: **Prof. Lucy W. Irungu, Dr. Cynthia Maxwell,**

Dean & Prof. Habwata Mweene, Prof. Catherine A.

Odora Hoppers, Prof. F. Beryl Pilkington

GALA DINNER AND KEYNOTE ADDRESS

19:00 – 21:00

Gala Dinner and Keynote Address (International)

Prof. Ronald Laporte

Prof. Emeritus, Graduate School of Public Health

University of Pittsburgh, U.S.A.

& Emeritus Director, WHO Collaborating Centre

*** **MONDAY 31 AUGUST 2015** ***

09:00 – 12:00

PLENARY SESSION 4

Strengthening Research & Education

09:00 – 10:00

Invited Address:

Prof. P. Balakrishna Shetty

Professor and Vice Chancellor

Sri Siddhartha University, Tumkur, India

The SASA-mediated India-Uganda Teleradiology Project

10:00 – 11:00

Session 5: Developing Future Science Education Programs

Moderator: **Prof: Alain L. Fymat**

SASA Vice Chair and Scientific Director &
President/CEO & Professor

International Institute of Medicine and Science, California, U.S.A.

11:00 – 12:00

Session 6: Developing Research Training

Dr. Eusebius J. Mukhwana

Commission for University Education, Kenya

13:00 – 14:00

Session 7: African Indigenous Knowledge

Prof. F. Beryl Pilkington

York University, Canada

14:00 – 15:00

PANEL DISCUSSION 4

Advancing Medical Research & Education in Africa

Moderator: **Prof. Lucy W. Irungu**

Panelists: **Dr. Francis Akena Adyanga, Prof. Joachim**

Kapalanga, Dr. Eusebius J. Mukhwana,

Prof. David M. Ndeti, Prof. Margareth Zanchetta, Prof. David

Zakus, Prof. F. Beryl Pilkington

15:00 – 16:00

PANEL DISCUSSION 5

**Promoting Inter-Institutional Relationships & Projects
Development**

Moderator: **Prof. Sam Lanfranco**

SASA International Director and Prof (Emeritus) Economics
York University, Toronto

Panelists: **Prof. Michaela Hynie, Prof. Ronald Laporte, Dr.**

Eusebius J. Mukhwana, Hon. Dr. Betty Pachuto Udongo, Prof.

Margareth Zanchetta, Prof. David Zakus

16:00 – 17:00

SASA Annual General Meeting (Open)

This book provides the Proceedings of SASA's 2015 Third International Scientific Conference that was held in Toronto, Canada. It is naturally subdivided into three parts respectively addressing science research, science education, and some of their applications.

Alain L. Fymat, PhD, PhD
SASA Director, Scientific Directorate and Chair, Scientific Committee

CHAPTER ONE

INTRODUCTION

ALAIN L. FYMAT

INTERNATIONAL INSTITUTE OF MEDICINE AND SCIENCE,
RANCHO MIRAGE, CALIFORNIA, U.S.A.

In his address, Professor Joachim Kapalanga (Executive President, Society for the Advancement of Science in Africa, SASA) advances a policy opinion on the advancement of science in Africa by choosing to emulate the successful approach of religious fraternities in pushing the frontiers of faith and religious belief on the African continent. Their methods and techniques were highly effective in penetrating diverse African cultures and efficaciously selling religious belief and faith with wholesome acceptance across the continent. They were successful in transforming an entire continent from animists to believers of various religious denominations.

Externally inspired modern scientific enterprises have had a presence in Africa over almost the same span of time as the religious enterprise, but without comparable success. At the end of the 19th century, colonial European countries opened colonial research facilities in agriculture, metallurgy and public health (infectious and tropical diseases). However, ground-breaking scientific advances have been few and far between despite considerable funding - certainly more funding than for the religious enterprise over similar time periods. Previous science and research projects seem to have had little enduring impact or multiplier effect to date. Even seemingly well-conceived recent projects have not endured and many have now folded. There were nonetheless scientific firsts conceived, described or discovered in Africa (Koch's postulates, Burkitt's lymphoma, endomyocardial fibrosis, Buruli ulcer, Christian Barnard's first human heart transplant, the biomedical science of heart transplantation, etc.) Why the scientific enterprise has neither registered

sustained success nor been as successful as the religious sodalities might be because the approaches followed were not concerted continentally, temporally sustained and/or may have overlooked local cultural considerations.

Professor Kapalanga therefore suggests that for SASA to push the frontiers of science in Africa it might perhaps require emulating the missionary sodality approach and thus avoiding the pitfalls of previous scientific and research enterprises on the African continent. This is not to advocate any sort of “religious science” but to emulate the methodology followed by the undeniably successful religious penetration of Africa. SASA has been conceptualized as an organized, coordinated, concerted, continent-wide advancement of science in Africa by local, regional, continent-wide and global effort and collaboration. Its vision is to provide a comprehensive forum in which to present and discuss science, research and education in Africa. Its mission is to attract and solidify Africa-focused science and research organizations, funding agencies, academic institutions, groups of researchers and individuals into a unified forum, facilitating concerted action and, hence, eliminating duplication of effort and waste of scarce resources.

Professor Kapalanga further envisions the creation of a SASA Centre to provide a central infrastructural hub for continental and international brain circulation in science research and education, which will include a SASA university, institutes of engineering, technology and innovation, as well as economic and business application of science. It will also include SASA laboratories, a research hospital, a medical school and a conference center. The infra-structural and institutional development and establishment of this Center will rely on convincing African governments and philanthropists to use the abundant local and natural resources for investment in science and local development of infrastructure and facilities for the advancement of science, not unlike the ubiquitous ecclesiastical infrastructures established at all levels of society by religious sodalities. The aim is to have a tangible active presence at all levels of society down to a village level. In appealing to soul and mind, and being relatable to local players, SASA will emulate the religious sodality approach – “act continentally and think locally”.