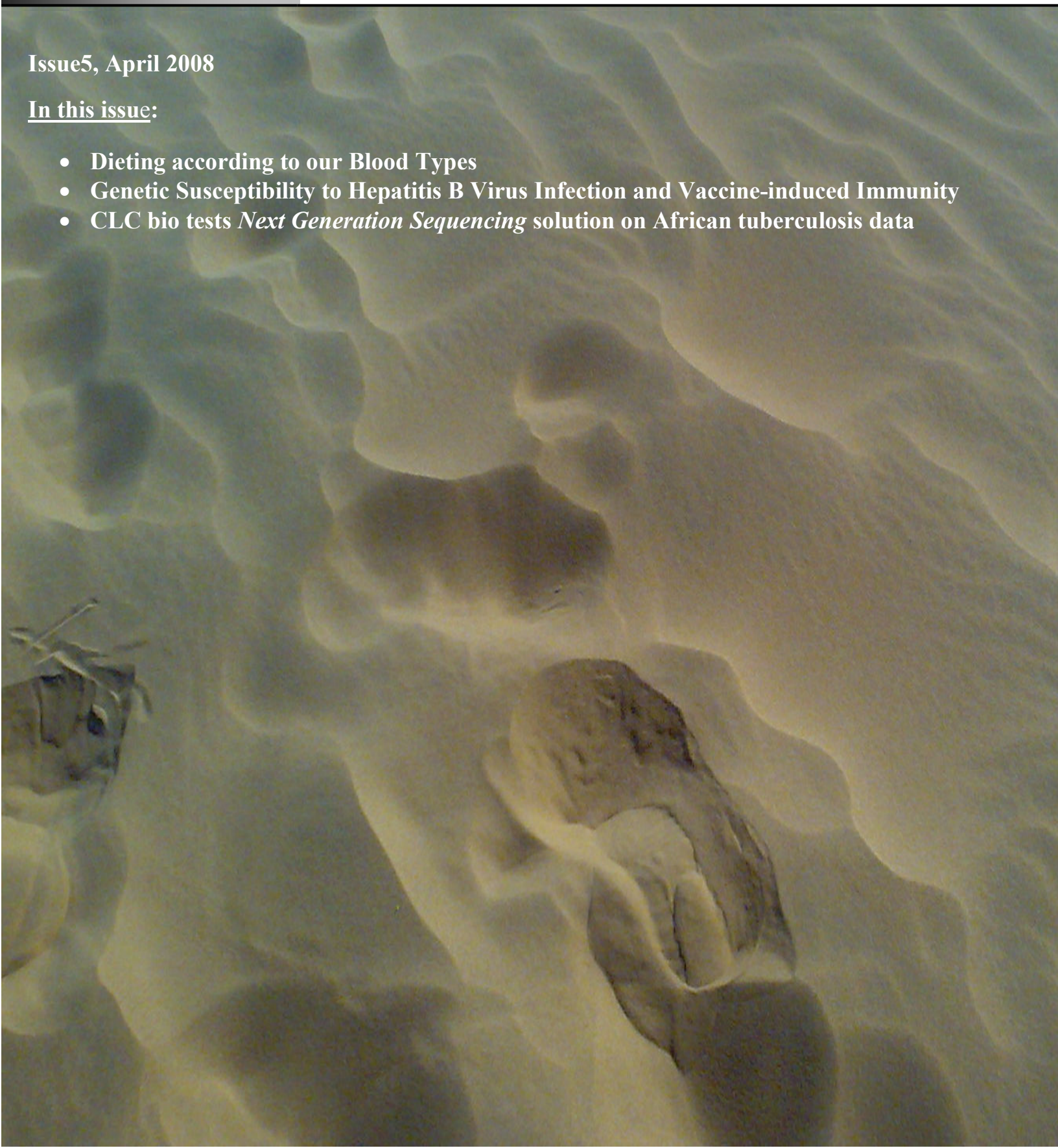
SAYS

SAYS newsletter

Issue 5, April, 2008

The Official Newsletter of the Sudanese Academy of Young Scientists



Issue5, April 2008

In this issue:

Editorial office

SAYS Newsletter is an electronic publication that contains reviews, reports, abstracts and brief communications .The Newsletter is intended to encourage young scientists to publish in basic and applied sciences and humanities.

Every effort is made to ensure that no inaccurate or misleading opinions or statements appear in the Newsletter. Opinions expressed in articles, correspondence or advertisements do not necessarily reflect the view of the Newsletter.

Manuscripts and advertising inquiries should be addressed to the Editor-in-chief at: saysnewsletter@gmail.com

Editorial

Welcome everyone to the fifth issue of SAYS newsletter, that I hope you enjoy. In this issue, I would like, at first, to thank Mr. Hisham Yousif, and the rest of the crew, for their confidence in naming me as Editor-in-chief, for the next period; a task that takes a lot of responsibility and endurance.

Through the subsequent issues of this period, we would like to bequeath new touches to the silhouette of the newsletter, these include new policies such as a new editing process that has reached a sophisticated level; we believe that these touches give the newsletter its unique appearance.

The most important policy is the encouragement of writing articles in fields we've never navigated before such as nanobiotechnology, pure mathematics… etc. we believe that this expansion is important for this period, so we encourage all of you to write articles for the newsletter; because we are seeking to make this newsletter the best medley and multidiscipline newsletter in Sudan.

We hope in the very near future that this newsletter will be a incomparable stage of science, this obsequious ambition, could never come to life without you, we encourage everyone to believe in us, to write to us, to share with us.

At the end, I recall that we have stated to launch SAYS Scientific Journal, all senior and young scientists are encouraged to participate in this next huge step.

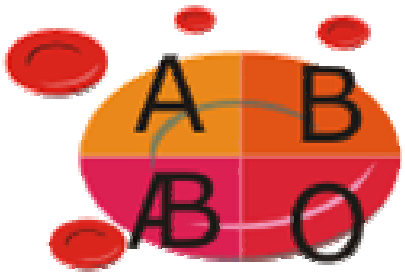
Husam Eldin E. Abugabr
Editor-in-chief

List of contents

Dieting according to our Blood Types

Background

The Blood Type Diet is the culmination of nearly four decades of work conducted by Peter D'Adamo, ND and his father, James D'Adamo, ND. As a naturopathic physician practicing in the 1960s, James wondered why some of his patients did well on the therapeutic diets he prescribed, including strict vegetarian and low-fat diets, while others did not improve or even became worse. James suspected that the difference in the way his patients reacted to the same foods might be rooted in some aspect of the blood. With this hypothesis in mind, he began to record the blood type of his patients and observe their individualized reactions to different diets. Over the years, distinct patterns began to emerge. He noticed that patients with Type A blood did well on a vegetarian diet, while patients with Type O did well on a high-protein, meat-based diet. In 1980, James D'Adamo published his clinical observations in a book titled *One Man's Food*. That same year, Peter D'Adamo began to research the scientific basis of his father's theories. In 1996, nearly twenty years later, Dr. Peter D'Adamo's findings were published in his first book, *Eat Right For Your Type*.



Principles

Dr. D'Adamo's ideas on the relationship between diet and health are rooted in a simple concept: your blood type O, A, B or AB-determines your body's ability to absorb nutrients, fight off diseases, and handle stress. Dr. Peter D'Adamo's diet recommendations were born out of evolutionary history, and, specifically, the observation that the different blood types emerged as the environmental conditions and eating styles of our ancestors changed. Between 50,000 BC and 25,000 BC, all humans shared the same blood type - Type O. These early humans were skilled hunters, and thrived on a meat-based diet. The Type A blood type emerged between 25,000 BC and 15,000 BC, a

necessary adaptation to a more agrarian lifestyle. Climactic changes in the western Himalaya Mountains led to the appearance of Type B, and the blending of Type A and Type B blood types in modern civilization resulted in the appearance of the Type AB blood type. Because the emergence of new blood types made it possible for our ancestors to survive the changing environmental conditions, Dr. D'Adamo believes that blood type, diet, and health are intricately related.

According to Dr. D'Adamo, the physiological reason why people should eat according to their blood type relates to *lectins*, which are protein-like substances found in many commonly eaten foods. Lectins, also known as phytohemagglutins, were first identified in 1888, at which time it was discovered that lectins interact with sugar-containing molecules on the surface of cells. This discovery allowed certain lectins to be used in blood typing, since blood type is determined by the presence (or absence) of specific sugar-protein residues on the surface of red blood cells. These residues are called antigens. Antigens play a crucial role in the function of the immune system, as they allow your body to distinguish between what is friend and what is foe. When an antigen enters your body that is unlike your blood type antigen, your immune system identifies it as a foreigner and prepares to attack and kill the invader. This process starts with the production of an antibody, which attaches to the foreign antigen, making it sticky and causing it to clump together with other antigens on viruses, bacteria, parasites, and cancer cells. This process, called agglutination, is necessary for your immune system to eradicate foreign invaders and protect you from colds, flues, and even cancer.

In the scenario above, agglutination is clearly a good thing - it allows your immune system to remove potentially harmful agents from the body. However, the clumping of blood cells is not always beneficial. At its extreme, such clumping can cause a blockage in your blood vessels, causing a stroke. The more harmful aspect of agglutination is the key to understanding the role of diet, lectins and blood type.

Although most of the lectins found in food are destroyed by cooking, digestive

enzymes, or are inactivated within the gut, at least 5% of the lectins we take in through our diet are absorbed into the bloodstream, and some of these are incompatible with our blood type. Many food lectins look very similar to the antigen that determines one of the four blood types or else bind directly to blood type antigens. In either case, this resemblance can lead to agglutination. According to Dr. D'Adamo "Simply put, when you eat a food containing lectins that are incompatible with your blood type antigen, the lectins target an organ or bodily system (kidneys' liver, brain, stomach, etc.) and begin to agglutinate blood cells in the area." Dr. D'Adamo implicates lectin-caused agglutination as a significant contributing factor to many common health complaints. Scientific evidence supports his contention; for example, the lectin component of gluten - a protein found in wheat and many other grains - is known to interact with the mucous membranes in the gastrointestinal tract of people with celiac disease creating inflammation. In summary, Dr. D'Adamo believes that if you want to prevent health problems, it is important to eat foods that are compatible with your blood type based upon their lectin content.

In the Blood Type Diets, foods are divided into sixteen categories: meats and poultry; seafood; dairy and eggs; oils and fats; nuts and seeds; beans and legumes; cereals; breads and muffins; grains and pasta; vegetables; fruit; juices and fluids; spices; condiments; herbal teas; and miscellaneous beverages. For each blood type, lists of foods described as "highly beneficial", "neutral", or "avoid" (based on the lectin content of the food) are provided for each category. In addition, a list of foods that promote weight gain and a list of foods that promote weight loss are provided for each blood type.

Blood Group O

This is the most common blood group. Dr D'Adamo says that our digestive tract retains the memory of ancient times, and so type Os need to eat a typical hunter-gatherer type diet. In other words, type Os should follow a high-protein, low-carb diet with lots of meat and fish but no dairy products, wheat or grains. Foods you can eat freely include meat, fish and olive oil; foods you can eat in moderation include eggs,

nuts, seeds, certain vegetables and fruits; and foods to avoid include dairy products, beans, cereals, bread, pasta and rice. To complement your food intake, Dr D'Adamo recommends lots of vigorous aerobic exercise such as aerobics and running - just like our hunter-gatherer ancestors did!

Blood Group A

This is the second most common blood group. Again according to Dr D'Adamo, digestive system is apparently very good at remembering that our ancestors had settled farming lifestyles, which included eating lots of grains and vegetables but little meat. Consequently, blood type A's should follow a vegetarian diet but still avoid dairy products. This means nuts, seeds, beans, cereals, pasta, rice, fruit and vegetable are all on the 'to eat' list. Meanwhile, calming exercises are thought to be best for blood type A's such as yoga or golf.

Blood Group B

Only one person in 10 has blood type B - a real shame when you consider this blood group has the least dietary restrictions! As our type B ancestors were able to thrive on all sorts of foods, thanks to all that traveling, very few foods need to be avoided and this is the closest you'll get to a healthy, balanced diet from Dr D'Adamo. The only foods that need to be avoided are processed foods, although nuts and seeds aren't recommended and only small amounts of carb-rich foods should be eaten. When it comes to exercise, Dr D'Adamo recommends activities that have mental component, such as hiking, tennis and swimming - clearly our ancestors did a lot of thinking while they were walking!

Blood Group AB

People with this rare blood type should eat a combination of the foods recommended for blood groups A and B. Somewhat confusing when type B allows you to eat most foods, while type A suggests a vegetarian diet! Dr D'Adamo gets around this by suggesting that type ABs follow a veggie diet most of the time with some meat, fish and dairy products occasionally. It's the same when it comes to exercise too - blood type ABs should combine calming exercises with moderately intense activities.

Sheima Hassan Abdulla Ahmed
Ahfad University for Women
hassan_sheima@hotmail.com

Genetic Susceptibility to Hepatitis B Virus Infection and Vaccine-induced Immunity

Hepatitis B

Persistent hepatitis B virus (HBV) infection affects 350 million people world-wide, with highest endemicity in Sub-Saharan Africa and China. Around half a million deaths each year are attributable to the end stage liver disease due to persistent infection, hence posing a significant disease burden. In The Gambia up to 70% of unvaccinated children were shown to be infected by the age of three and chronic liver disease / hepatocellular carcinoma account for around 10% of deaths in males [1, 2]. Infant immunisation against HBV infection was introduced in the mid 1980s and is now routinely administered across the African continent. This has been shown to be safe and effective, but longevity of protection and the potential need for a booster dose remains to be determined through longitudinal studies.

Susceptibility to HBV infection and HBV vaccine-induced immunity are influenced by a number of factors such as age, gender, UV light exposure, infectious diseases, nutritional factors …etc., but these will not be discussed here.

Susceptibility to HBV

Several lines of evidence suggest a role of genetic susceptibility to HBV infection. There is an increased ratio of persistent infection in males compared to females. Monozygotic twins have a higher concordance of carriage than dizygotic twins. Clustering of cases can be observed in families and there are differences in prevalence by ethnicity. Nevertheless, the only genome-wide genetic linkage study carried out to date (to my knowledge), described the class II cytokine receptor gene cluster on chromosome 21 to be a major locus for HBV susceptibility [3].

More data are available from a number of disease association studies [4-6]. The majority of these have concentrated on human leukocyte antigen (HLA) gene variation Reports on other candidate genes include: VDR, TNFα, TNFβ, CTLA4, CCR5, RANTES, ESR1, IL10, KIR, FAS, FasL, IL18, TBX21, IFNG, IFNAR1, CD14,

CD45 and others. However, the interpretation of findings from such studies can be very difficult as sample sizes are often small, results may not have been replicated or conflicting effects are being reported. This could be due to genetic heterogeneity, population stratification, type I errors, confounding by other infectious diseases etc., but also reflects the polygenic nature of susceptibility to HBV infection.

HBV vaccine-induced immunity

Protection against HBV infection and persistent carriage induced by infant immunization is high, yet the level of protective vaccine-induced antibody decreases over time whilst the rate of 'breakthrough' infection (i.e. anti-HBV positivity) increases. Processes such as antigen presentation and recognition, the magnitude or kinetics of antibody response, lymphocyte proliferation, and long-term immune memory, are likely to be influenced by host genetic factors. However, very few studies in this field have been published to date.

Family and twin studies have demonstrated that genetic factors influence vaccine immunogenicity [7]. Höhler *et al* (2002) as well as Newport and colleagues (2004) showed that HLA variation affects the heritability of HBV vaccine-induced immunity, but suggested that up to 50% of heritability may be determined by non-MHC genes [8, 9].

A number of candidate gene studies have also linked HLA variation to immunity induced by HBV vaccination and these results are relatively consistent [7, 10]. Much less is known about the role of non-HLA genes, but there are some reports on associations with polymorphisms in the IL1 gene family, IL2, IL4, IL6, IL10, IL12β, TNFα, GNB3, and haptoglobin. Similar to disease association studies, the majority of these reports are limited by their small sample size, number of polymorphisms/genes screened and few of these associations have been confirmed.

Summary

It is clear that our understanding of the role of genetic factors in the response to HBV infection or vaccination is limited and many research questions remain unanswered. For instance it would be interesting to see whether genetic variants modulating the immune-

response to HBV vaccination may also affect susceptibility to infection. However, with the arrival of whole-genome association studies in large sample collections, lower genotyping costs and parallel advances in related disciplines such as bioinformatics and virology we will make steady progress in this field of research. This will create opportunities for the development of new and improved detection and treatment methods as well as better vaccines, which will eventually reduce the disease burden related to HBV infection world-wide.

References

1. Whittle HC, Bradley AK, McLauchlan K, Ajdukiewicz AB, Howard CR, Zuckerman AJ, McGregor IA: Hepatitis B virus infection in two Gambian villages. *Lancet* 1(8335):1203, 1983.
2. Wild CP, Hall AJ: Primary prevention of hepatocellular carcinoma in developing countries. *Mutat Res* 462(2-3):381, 2000.
3. Frodsham AJ, Zhang L, Dumpis U, Taib NA, Best S, Durham A, Hennig BJ, Hellier S, Knapp S, Wright M, Chiaramonte M, Bell JI, Graves M, Whittle HC, Thomas HC, Thursz MR, Hill AV: Class II cytokine receptor gene cluster is a major locus for hepatitis B persistence. *Proc Natl Acad Sci U S A* 103(24):9148, 2006.
4. Thursz M: Genetic susceptibility in chronic viral hepatitis. *Antiviral Res* 52(2):113, 2001.
5. Frodsham AJ: Host genetics and the outcome of hepatitis B viral infection. *Transpl Immunol* 14(3-4):183, 2005.
6. He YL, Zhao YR, Zhang SL, Lin SM: Host susceptibility to persistent hepatitis B virus infection. *World J Gastroenterol* 12(30):4788, 2006.
7. Kimman TG, Vandebriel RJ, Hoebee B: Genetic variation in the response to vaccination. *Community Genet* 10(4):201, 2007.
8. Hohler T, Reuss E, Evers N, Dietrich E, Rittner C, Freitag CM, Vollmar J, Schneider PM, Fimmers R: Differential genetic determination of immune responsiveness to hepatitis B surface antigen and to hepatitis A

virus: a vaccination study in twins. Lancet 360(9338):991, 2002.

9. Newport MJ, Goetghebuer T, Weiss HA, Whittle H, Siegrist CA, Marchant A: Genetic regulation of immune responses to vaccines in early life. Genes Immun 5(2):122, 2004.
10. Thursz M: MHC and the viral hepatitides. Qjm 94(6):287, 2001.

Branwen J. Hennig

London School of Hygiene & Tropical Medicine, London, UK

Branwen.Hennig@lshtm.ac.uk

From Numbers to Probabilities

(Part 4)

The Great Leap

An historical review cited in

Peter L. Bernstein's "AGAINST THE GODS the remarkable story of risk"

Previously, we reviewed the contribution of two Italians, Girolamo Cardano and Galileo. Twelve years after the death of Galileo in 1642, three Frenchmen took a great leap forward into probability analysis, Blaise Pascal, Pierre de Fermat, and the Chevalier de Méré. They worked inductively in creating - for the first time a theory of probability -which provided a measure of probability in terms of hard numbers, a climactic break from making decisions on the basis of degrees of belief.

He spent half of his life torn between pursuing a career in mathematics and yielding to religious convictions. Although he was a brilliant mathematician and proud of his accomplishments as a "geomaster", his religious passion ultimately came to dominate his life.

Pascal began life as a child prodigy, educated by his father. He was fascinated with shapes and figures and discovered most of Euclidean geometry on his own by drawing diagrams on the tiles of his playroom floor. At the age of 16, he wrote a paper on the mathematics of the cone; the paper was so advanced that even the great Descartes was impressed with it.

Blaise Pascal

This enthusiasm for mathematics was a convenient asset for Pascal's

father, who was a mathematician in his own right and earned a comfortable living as a tax collector, a functionary known at the time as a tax farmer. The tax farmer would advance money to the monarch – the citizenry - the equivalent of gathering in a harvest whose ultimate value, as with all farmers, he hoped would exceed the cost of the seeds.

While Pascal was still in his early teens, he invented a calculating machine to ease the dreary task of adding up his father's daily accounts called Pascaline. This contraption, with gears and wheels that went forward and backward to add and subtract, was similar to the mechanical calculating machines that served as precursors to today's electronic calculators. Young Pascal managed to multiply and divide on his machine and even started a method to extract square roots. Unfortunately he was unable to commercialize his invention commercially because of prohibitively high production costs.

Recognizing his son's genius, Blaise's father introduced him at the age of 14 into a select weekly discussion group that met at the home of a Jesuit priest named Marin Mersenne, located near the Place Royal in Paris. Abbé Mersenne had made himself the center of the world of science and mathematics during the first half of the 1600s.

In the absence of learned societies, professional journals, and other means of the exchange of ideas and information, Mersenne made a valuable contribution to the development and dissemination of new scientific theories. The Académie des Sciences in Paris and the Royal Society in London, which were founded about twenty years after Mersenne's death, were direct descendants of Mersenne's activities.

The early papers of Blaise Pascal in advanced geometry and algebra impressed the high-powered mathematicians he met at Abbé Mersenne's, he soon acquired a competing interest. In 1646, his father fell on ice and broke his hip. The bonesetters called in to take care of Pascal's father happened to be members of a proselytizing Catholic sect called Jansenists. While they were staying for three months to work on M. Pascal who accepted their doctrine with enthusiasm. Religion commanded Blaise Pascal's full attention. All he could offer by way of

explanation was to ask "Who has placed me here? By whose order and warrant were this place and this time ordained for me? The eternal silence of these infinite spaces leaves me in terror".

The terror became so overwhelming that in 1650, at the age of 27, Pascal succumbed to partial paralysis, difficulty in swallowing, and severe headaches.

Pascal resumed his researches in mathematics and related subjects. In one of his experiments he proved the existence of vacuumsby generalizing the work of Evangelista Torricelli, in a controversial issue ever since Aristotle had declared that nature abhors a vacuum. In the course of the experiment he demonstrated that barometric pressure could be measured at varying altitudes with the use of mercury in a tube emptied of air.

Pascaline: Pascal calculator

Pascal became acquainted with the Chevalier de Méré, who prided himself on his skill at mathematics and on his ability to figure the odds at the casinos. Even Leibniz himself must have been impressed for his description of the Chevalier as 'a man of penetrating mind who was both a gambler and a philosopher".

At the time he first met Pascal, the Chevalier was discussing with a number of French mathematicians Paccioli's old problem of the points – how should two players in a game of balla share the stakes when they leave the game uncompleted? Pascal was fascinated with the problem, but he was reluctant to explore it on his own.

He turned to Pierre de Carcavi, a member of Abbé Mersenne's group, who put him in touch with Pierre de Fermat, a lawyer in Toulouse.

Fermat was born in August 17th, 1601, in Bequmont-de-Lomagne, north-west of Toulouse, France. In 1631 he received the title of Councilor at the High Court of Judicature in Toulouse.

Fermat's erudition was remarkable; he spoke all the principal European languages (Latin, Greek, Italian and

Spanish) and even wrote poetry in some of them. In addition, he was a busy commentator on the literature of the Greeks and Romans, a mathematician of rare power, and was an independent inventor of analytical geometry. He contributed to the early development of calculus, he did research on the weight of the earth, and he worked on light refraction and optics. In the course of what turned out to be and extended correspondence with Pascal, he made a significant contribution to the theory of probability.

Pierre de Fermat

Fermat's pioneering work in analytic geometry, *Ad Locos Planos et Solidos Isagoge*, was circulated in manuscript form in 1636, predating the publication of Descartes' famous *La géométrie*. This manuscript was published posthumously in 1679.

In *Methodus ad disquirendam maximam et minima* and in *De tangentibus linearum curvarum*, Fermat developed a method for determining maxima, minima, and tangents to various curves that was equivalent to differentiation. In these works, Fermat also obtained a technique for finding the centers of gravity of various plane and solid figures, which led to his further work in quadrature.

Fermat was the first person known to have evaluated the integral of general power functions. Using an ingenious trick, he was able to reduce this evaluation to the sum of geometric series. The resulting formula was helpful to Newton, and then Leibniz, when they independently developed the fundamental theorem of calculus.

In number theory, Fermat studied Pell's equation, Fermat numbers, perfect, and amicable numbers. It was while researching perfect numbers that he discovered the little theorem. He also

invented a factorization method which has been named for him as well as the proof technique of infinite descent, which he used to prove Fermat's Last Theorem for the case $n = 4$. Fermat also developed the two-square theorem, and the polygonal number theorem, which states that each number is a sum of three triangular numbers, four square numbers, five pentagonal numbers, and so on.

Fermat crowning achievement was the theory of numbers (the analysis of the structure that underlies the relationships of each individual number to all the others); these relationships present countless puzzles, not all of which have been resolved to this very day

Fermat scribbled his famous note "Fermat's Last Theorem", in the margin of his copy of Diophantus's book *Arithmetic*. His simple comment left mathematicians dumbfounded for over 350 years as they struggled to find a theoretical justification for what a great deal of empirical experimentation proved to be true. In 1993, an English mathematician named Andrew Wiles claimed that he had solved this puzzle after seven years of work in a Princeton attic. Wiles's results were published in the Annals of Mathematics in May 1995, but the mathematicians have continued to squabble over exactly what he had achieved.

Fermat's Last Theorem is more of a curiosity than an insight into how the world works. But the solution that Fermat and Pascal worked out to the problem of the points has long since been paying social dividends as the cornerstone of modern insurance and other forms of risk management.

The solution to the problem of the points begins with the recognition that the player who is ahead when the game stops would have the greater probability of winning if the game was to continue. But how much greater, are the leading player's chances? How small are the lagging player's chances? How do these riddles ultimately translate into the science of forecasting?

The 1654 correspondence between Pascal and Fermat on this subject signaled an epochal event in the history of mathematics and the theory of probability. In response to the Chevalier de Méré's curiosity about the problem,

they constructed a systematic method for analyzing future outcomes i.e. when more things can happen than will happen. Pascal and Fermat gave us a procedure for determining the likelihood of each of the possible results, assuming always that the outcomes can be measured mathematically.

They approached the problem from different standpoints, Fermat turned to pure algebra, and Pascal was more innovative as he used a geometric format to illuminate the underlying algebraic structure.

The basic mathematical concept behind this geometric algebra had been recognized long before Fermat and Pascal took it up. Omar Khayyam had considered it some 450 years earlier. In 1303, a Chinese mathematician named Chu Shih-chieh, explicitly denying any originality, approached the problem by means of a device that he called the "Precious Mirror of the Four Elements", Cardano, who was mentioned in previously, also mentioned such a device

Chu's precious mirror has since come to be known as Pascal's Triangle. "Let no one say that I have said nothing new" boasts Pascal in his autobiography.

To be continued

Husam Abugabr
University of Shendi
husamabugabr@yahoo.com

Critiques of Billie R. DeWalt's Article:
Using Indigenous Knowledge to Improve Agricultural and Natural Resource Management
Part Two

In the first part of the article I reviewed the characteristics of both indigenous and traditional scientific knowledge in managing natural resources of different settings. In the proceeding part of the topic, I will discuss the importance of a holistic approach or in between knowledge that can overcome the short comings of scientific and indigenous knowledge in natural resource management. The social scientists are suggested as mediators who can implement this holistic approach. Finally, I tried to explain the social and political framework which can assist in implementing the in between knowledge in regulating natural resources at both micro and macro levels.

A holistic approach is needed to solve problems in natural resource regulation instead of fragmenting the problem into different parts dealing with them separately but at the same time scientific knowledge is needed. In the case of infected crop we need to observe the interaction of the different elements of the ecosystem such as insects, humans, and climate factors with the causer of the infection, in addition to the usage of scientific method(s) during this process, (e.g. use of microscopic technique to identify the pathogen).

The treatment of the problem will be a combination of scientific methods and the methods that has been identified and practised within the ecosystem by the local people .In this case integrated pest management practices could be very sound.

In slash and burn case, there is a need for the scientific methods in order to increase the efficiency of the system.For example, introducing fertilizer or mechanic equipment to the level that does not degrade the environment but enable the local people to increase the production for the market.

Communicating and understanding the needs of the local communities are the nature of social scientist's work. This fold to the fact that the

transformation of the invented 'in-between knowledge' will be the responsibility of the social scientists.

In 1994, DeWalt defined the role of the social scientists in transferring knowledge to the communities as follows; social scientists can identify the situation as significant to farmers as the local people some times can not identify which species of insects causes the damages to the crops they grow. In this case social scientists assist the local people to identify and report that the insects are the cause of the significant loss in the crop produce. Also the social scientists can identify the strategies of the resource management, as in the case of the Runa people of the Ecuadorian Amazon.

DeWalt also mentioned for the transformation to take place, social scientists must work closely with biological agriculture scientists to understand the kind of technologies and policies needed. Finally since the knowledge could be very contextual, social scientists can work in cooperation with different indigenous groups that can learn from each other.

However, in my opinion DeWalt has emphasised the role of social scientists in transferring the (in-between knowledge) alone as a top-down approach in itself without broadening the discussion on the situations or the circumstances of the social settings where the transformation should take place. In other words, he down-looked some determining factors affecting the process of transformation. For example, the necessity for the existence of a strong social capital among the people who are meant to receive and deal with such new inventions or ideas "net-works, norms and trust that allows agents and institutions to be more effective to achieve a common goal".

The stronger the institutional setting of the local people such as farmers' societies, youth clubs, women groups, and the easiest will be the adoption of the new knowledge and technologies. Moreover, the existence of such institutions will regulate and systematise the process of learning and communication with outsider knowledge. Even if such kinds of institutions are found, in most cases these institutions are lacking essential

skills and capacities including training, education and the ability to compete with each other. In other words the human capital of such communities is usually very weak.

A third important factor which DeWalt had to discuss further is the agricultural and economical policies that are formulated in every context. For example, in the third world it is found that the policies that are regulating natural resource management usually marginalise the majority of peasants. Since the consensus of development for many governments means converting of forests and rangeland into reserved areas or agriculture lands, the losers are usually are the indigenous groups or farmers. Unfortunately, this concept for development had been inherited from the colonial and postcolonial governments during the past eighteenth and nineteenth century. A clear example for this is the belief that the degradation of the Sudano–Sahelian belt in the sixties is caused by overpopulation which led to over- exploitation of the resources (neo-Malthusian discourse)[1]. However, due to the global economical and social changes there is some evolution in the development policies of some countries, especially those that are witnessing changing into more democratic regimes, such as Zambia and Tanzania. In such countries, recommendations of the World Summits such as Rio de Janeiro, 1992, would receive more commitments and trends to apply. For example, one of the development trends that come out as a result of Rio Summit is conserving the biodiversity of our planet. Researches have proven that indigenous practices are some of the factors that are enhancing the natural resource base.

Recently many Governments and Non-Governmental Organisations all over the world are working alongside with this trend of development. Accordingly, in my view, social scientists need to work side by side with policy makers in order to have clear policy framework that will enable stakeholders from different sectors to

[1] Discourse is a term related to political ecology, discourse means a shared meaning of phenomenon. (Adger *et al*., 2001).

have an equal right to share and utilise the base of the natural resources.

To sum up, in my opinion, transfer of mutable mobile knowledge systems as stated by DeWalt is a long process that involves many changing agents and needs many basic requirements. Social capital and human capital of the contexts where the transformation is going on have to be well growing and strong enough to facilitate the transfer. The development policies that are formulated to direct the development planning in different contexts have to be flexible toward the dynamics of the globe. The mentioned factors are key factors that social scientists need to take care of while playing the role of mediating the transfer of the so-called the (in-between knowledge) systems so as to gain a sustainable resource management.

Further readings:

DeWalt, B. R. (1994), Using Indigenous Knowledge to Improve Agriculture and Natural Resource Management, *Human Organization* 53, 2.

Tyseer Elhadi Omer
Faculty of Agriculture, U. of K.
University of Khartoum.
tyseer555@yahoo.com

FOR IMMEDIATE RELEASE

CLC bio tests *Next Generation Sequencing* solution on African tuberculosis data

Aarhus, Denmark and Pretoria, South Africa -- February 12, 2008 -- The world's leading bioinformatics solution provider, CLC bio, has joined forces with the first center for High Throughput DNA Sequencing in Africa, Inqaba Biotechnical Industries (Pty) Ltd., in an effort to help fight tuberculosis on the African continent. Together CLC bio and Inqaba Biotec will assemble and analyze data from multiple tuberculosis strains, sequenced on Inqaba Biotec's Genome Sequencer FLX system.

CLC bio, is in the final stage of development of their upcoming CLC Genomics Workbench, which is a new workbench aimed at next generation sequencing and whole genome assembly. The new workbench will support all next generation sequencing platforms, such as Roche GS FLX (454), Illumina Gene Analyzer System (Solexa), and SOLiD Analyzer from Applied Biosystems from the start - with Helicos and others to be included in the near future.

Dr. Oliver Preisig, Executive Director at Inqaba Biotechnical Industries, states:

'The consortium's goal is to find the genetic differences between different strains of Mycobacterium tuberculosis. We target our genome sequencing on XDR (Extreme Drug Resistant) and MDR (Multi Drug Resistant) strains of the bacterium. Having assembled the genomes of these strains we can find the strains' specific markers and develop a PCR test that could bring much faster diagnosis for proper treatment. This means we have an urgent need for whole genome sequencing, and look forward to CLC bio's upcoming workbench, which will provide an intuitive and fast solution.'

Senior Scientific Officer at CLC bio, Dr. Roald Forsberg, continues *'We are really exited to join forces with Inqaba Biotec in their Tubercolosis research program. The large amount of genomic data Inqaba Biotec produces offers us an exciting opportunity to test and fine tune our algorithms on real and challenging data - and at the same time it allows us to contribute to the ongoing fight against Tuberculosis. This is a great motivation to our developer team.'*

The South African Mycobacterium tuberculosis genome sequencing project is funded by BioPAD, a Biotechnology investment trust funded by the Department of Science and Technology of South Africa and includes as consortium members the Chris Hani Baragwanath business unit of the National Health Laboratory Services, the Respiratory and Meningeal Pathogens Research Unit at the University of Witwatersrand and Inqaba Biotec.

The upcoming CLC Genomics Workbench will among other things feature an SIMD accelerated genome assembler, and will take full advantage of "paired ends" data. CLC bio will release CLC Genomics Workbench in the spring.

Read more about Next Generation Sequencing at:

www.nextgenerationsequencing.com

About CLC bio

CLC bio is the world's leading full-service bioinformatics solution provider, solely focusing on the development of bioinformatics: software, hardware, data analysis, and custom-designed bioinformatics algorithms. CLC bio is an Apple solution provider and value added reseller.

CLC bio's mission is to be among the most innovative bioinformatics companies in the 21st century. This is realized through:

- Development of bioinformatics software and hardware based on the latest scientific findings
- User-friendly, integrated and intuitive cross-platform software solutions
- Continuous focus on customer needs and superior customer service
- Frequent product updates including the latest IT technologies and bioinformatics algorithms
- A flexible IT architecture, enabling customers to buy or develop

individualized solutions at a reasonable price

About Inqaba Biotec

Inqaba Biotechnical Industries (Pty) Ltd, trading as Inqaba Biotec, is a private South African genomics company founded in 2002. Inqaba Biotec was initiated and funded by a few scientists from South Africa, the USA, Germany and Switzerland. Inqaba Biotec is based in Pretoria, South Africa. A Swiss government loan with the aim of facilitating investments in developing and emerging countries was crucial in the start-up years. At the end of 2005 BioPAD (www.biopad.org.za), a Biotechnology investment trust funded by the Department of Science and Technology of South Africa, joined Inqaba Biotec as a shareholder and strategic partner. Inqaba Biotec's customer base covers the whole of South Africa as well as other Sub-Saharan countries. In March 2007, Inqaba Biotec started offering a genome sequencing service using first a GS 20 and later a GS FLX from Roche as part of an infrastructure investment by BioPAD.

For further information, please visit Inqaba Biotec's website.

Contact

For further information, please contact:

Thomas Knudsen, CEO, CLC bio

Phone: +45 70 22 55 09

Mobile: +45 51 31 71 51

E-mail:info@clcbio.com

Website: www.clcbio.com

About SAYS

The Sudanese Academy of Young Scientists (**SAYS**) is a non-governmental organization. It has been officially registered at the Ministry of Humanitarian Affairs under the umbrella of the Sudanese National Academy of Sciences (SNAS).

On the 15th of January 2007, the inaugural meeting of the Sudanese Academy of Young Scientists (**SAYS**) was held in the Institute of Endemic Diseases, University of Khartoum, and the proposal for establishing the Academy was discussed and approved.

The objectives of SAYS are:

- Promote research and uphold the cause of science in its basic and applied forms.
- Help in the dissemination of science and research results through publishing and assisting in publishing periodicals, and through organization of scientific meetings.
- Raise community awareness about the importance of science and technology in sustainable social, economic and environmental development.
- Collaborate with similar regional and global organizations.
- Raise funds and accept endowments for the purpose of fulfilling its objectives.
- Help in capacity building of scientific institutions in the country.
- Award grants, scholarships, prizes and medals in the field of research for young scientists.

Membership Criteria:

There are three types of membership; Full Membership, Partial Membership and Honorary Membership.

Full Membership: The member should be below 40 yrs and has at least a master degree in basic or applied sciences.

Partial Membership: The member should be at least a B. Sc holder in basic or applied sciences and not more than 30 yrs old.

Honorary Membership: The member should have a university degree in basic or applied sciences and over 40 yrs.

INSTRUCTIONS TO AUTHORS

Articles should be sent to the Editor-in-chief at saysnewsletter@gmail.com

1. Articles should be original and **NOT** submitted for publication elsewhere.

2. One complete electronic or hard copy of each article, including illustrations, should be provided on A4 paper, typed in 1.5 spacing, with 2.5 cm margins.

3. Tables should be used to present large amounts of numerical data and when they simplify the text: they should not duplicate the text. Each table should be typed on a separate sheet in double spacing, without ledger lines, together with its identifying Roman numeral and a short title.

4. The quality of illustrations in he Journal is dependent on the quality of the photographs, images and figures provided. Every effort should be made to ensure that these are the best available.

5. Articles submitted for publication will be evaluated by the Editorial Board.

6. Rejected manuscripts and illustrations will not be returned unless a specific request to do so is made at the time of submission.

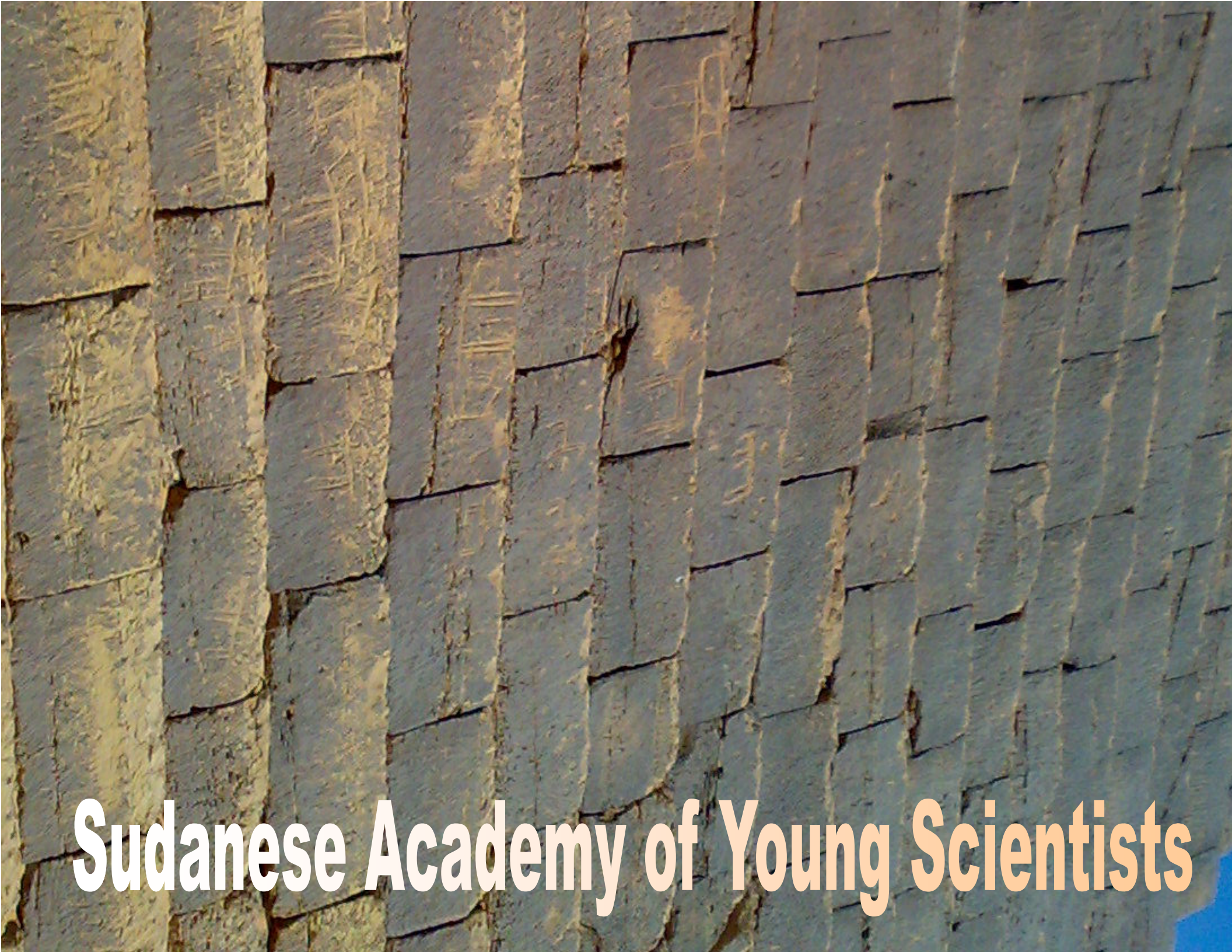
SAYS newsletter

Tel: +249911746335

Khartoum, Sudan

Email: saysnewsletter@gmail.com

Website: http://says.9f.com


Sudanese Academy of Young Scientists