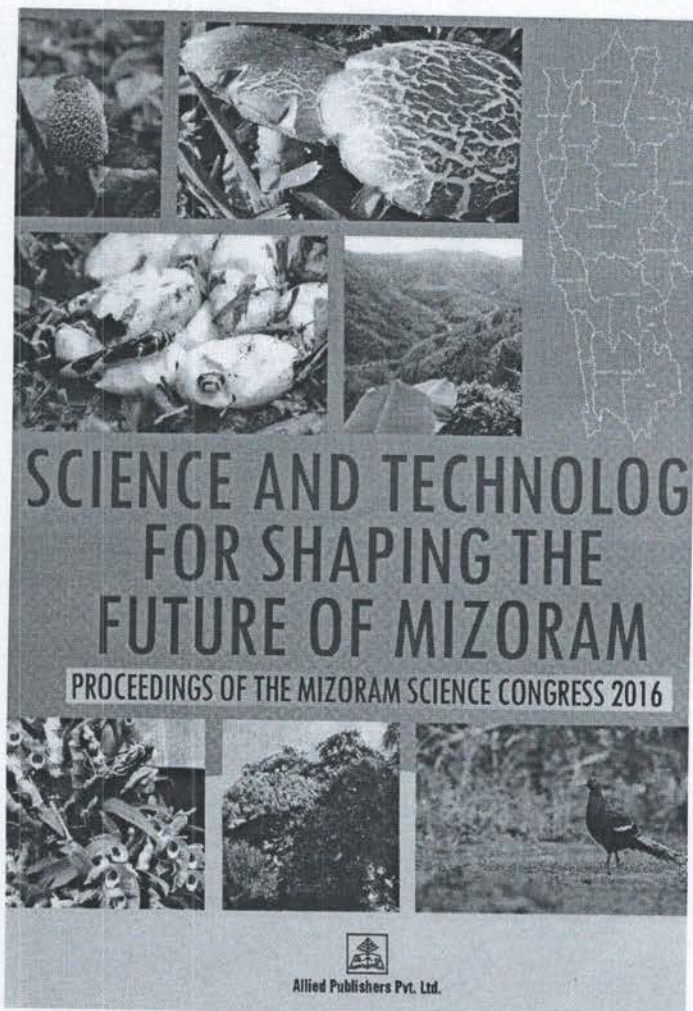




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ISBN: 978-81-85926-49-5

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Science and Technology for Shaping the Future of Mizoram

Allied Publishers
New Delhi
2017
ISBN 978-81-85926-49-5

Chapter 23

Malaria: Challenges on Drug Resistant Genes and Vaccine Development

Zolunpui, Vanlalruati and N. Senthil Kumar

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ABSTRACT: Malaria caused by *Plasmodium* parasites, remains a major cause of morbidity and mortality in the developing world. The characterization of the function and evolution of the genes underlying the susceptibility or resistance to anti-malarial treatment to our understanding of its treatment and eradication. Molecular markers for antimalarial resistance (including drug resistance transporter *cdmr*, dihydrofolate reductase *dhfr* and dihydropteridine synthase *dhps*) are associated with resistance to chloroquine, mefloquine, quinine, and artemisinin. Several steps to develop malarial vaccines have been undertaken targeting various developmental stages of the parasite. Use of such genetic information for the early detection of resistance foci and future monitoring of drug-resistant malaria is a potentially useful epidemiological tool.

KEYWORDS: *Plasmodium*, Antimalarial Resistance, Gene Evolution, Chloroquine Resistance Transporter, Dihydrofolate reductase, Dihydropteridine synthase.

INTRODUCTION

Malaria is not just a disease but a major public health problem that has impacts on socio-economic progress of individuals, families and the society as a whole. The South-East Asia Region (SEAR) has been under the burden of malaria for many decades. The region is home to nearly 2.5 billion people potentially at risk of contracting malaria. Approximately 67 per cent of the population in the four known malaria parasites are known. The four known malaria parasites are *P. falciparum*, *P. vivax*, *P. malariae* and *P. knowlesi*. *P. falciparum* accounts for nearly 50 per cent of the total malaria cases in the region (a). In the south-east Asian Region of WHO, 1.4 billion people are exposed to the risk of malaria, the number of confirmed cases totaled up to 2.1 million and the number of deaths amounted to 1819 during 2015 (WHO-SEARO website). Epidemiological models undertaken by Snow *et al.* (2005) on account of clinical episodes for areas outside Africa estimated 200% higher than that reported by the WHO, i.e. 118.94 million out of global estimates of 515 million cases. Of the total burden of malaria in India, North-Eastern states contribute 10% malaria and 11% *P. falciparum* cases and 20% malaria deaths (Sharma, 1991). In Mizoram, during 2012 to 2015 the total malaria confirmed cases were as high as 37125 of which 91.8% are *P. falciparum* cases (Table 1) (Anonymous 2016). The incidence of malaria is high

Table 1: Epidemiology of Malaria in Different Districts of Mizoram

District	2012		2013		2014		2015		Ar-APR of 4 years
	API	P.f%	API	P.f%	API	P.f%	API	P.f%	
Aizawl	1.25	94.07	0.405	95.243	1	75.165	1.4	75.165	1.02
Champhai	17.62	97.76	6.6	94.98	20.67	88.32	26	88.32	17.73
East Khasi	40.11	97.90	19.82	97.66	3.16	75.41	8.5	75.41	17.89
Imphal	4.37	86.36	1.03	85.45	4.02	88.46	3.8	88.46	3.31
Jaintia	42.64	92.47	23.92	93.71	11.88	95.45	22	95.45	25.18
Lunglei	50.59	90.44	23.52	96.03	0.37	76.09	0.7	76.09	14.03
North Khasi	15.09	78.27	6.15	81.07	41.36	88.35	36	88.35	24.61
South Khasi	0.79	75.76	0.57	79.17	11.16	77.46	1.1	77.46	0.91

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Study of Vp/Vs versus Depth Variation within the Seismogenic Zone in Surma Valley along Selected Depths

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ABSTRACT: An emphasis has been made to observe the variation of Vp/Vs ratio for shallow earthquakes recorded at close range within the seismogenic zone in Surma valley along selected depths ranges to identify and to obtain reasonable seismic properties of the crust underneath. Simultaneously how the valley is related to its adjoining region, so far as the seismic properties among the regions are concerned, becomes useful in identifying gross lateral changes within the region.

INTRODUCTION

It is well known that compressional and extensional seismic waves in the crust exhibit significant regional variations. P-wave and S-wave travel time propagating from the same source to the same station with equal time independent of azimuth show different anomalies in various regions. The seismic signal which is recorded as the first arrival depends on the crust – upper mantle structure between source and receiver, instrumental characteristics and the noise levels at the recording site. Simple techniques involving the earthquake data, including Wadati-takenaka diagrams allows one to resolve the tradeoff in origin time and focal depths. Estimates of the average half wave velocities for P- and S-waves, and of the travel time difference ($T_p - T_s$) helps to understand the material property of the crust. A comprehensive variation of velocity of P- and S-wave arrivals with depth can be regarded as the path and specific inhomogeneities between the source and receiver. Knowledge of a P-wave velocity over an S-wave velocity is an important information on the physical properties of the crust. The Vp/Vs ratio of crustal rocks are mainly controlled by the mineral contents of plagioclase with high Poisson ratio and silica with low Poisson ratio. The presence of partial fluids of partial melting form a high Vp/Vs ratio. Shear wave velocities diminish more at the presence of fluids within the upper crust than compressional wave velocities hence observation regarding Vp/Vs ratio could help to gain a better understanding about the characteristics of crust and researchers have used Vp/Vs ratio to infer the property of the crust.

MATERIALS AND METHODS

Wadati-takenaka diagrams from shallow and intermediate depth earthquakes recorded by selected seismic stations

network in the Northeast during 1982 to 2009 are used for this study. Origin time, epicentral coordinates (latitude and longitude) and depth of the earthquakes were determined using the HYPOCENTER computer program of Linert *et al.* (1986). For initial location of the micro-earthquakes the velocity of upper crust (0–20 km) was assumed to be 5.5 km/s and the lower crust (21–40 km) to be 6.5 km/s and the mantle (below 40 km) to be 8.1 km/s.

The reconstructed travel time of P- and S-waves versus epicentral distances obtained from the best linear fit of Wadati and Ruzhichenko diagrams are used to determine the ratio of the velocity of Vp/Vs versus depth in Surma valley and its vicinity comprising the upper crust beneath Mat fault area in the eastern part and Sylhet fault area in the northern part. Depth ranges are selected at 20 km intervals and the parameters are distributed accordingly.

In addition, a set of 20 earthquakes are used for determination of Vp and Vs associated to Mat fault region at different depth ranges and 19 earthquakes are used for determination of Vp and Vs in Sylhet fault region at different depth ranges respectively. Certain standards were used to select the earthquakes for this set; firstly, the P and the S phases should be well recorded by at least five stations; secondly, the earthquake should occur within the study area and; finally, the reading of P and S phases should be accurate one.

RESULTS

The Vp/Vs ratio down to a depth of 60 km from the obtained P- and S-wave travel times is computed. Vp/Vs ratio has been estimated by dividing Vp by Vs using the results obtained from Wadati and Ruzhichenko diagrams. It uses direct P- and S-waves with predominant frequencies of

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SCIENCE AND TECHNOLOGY FOR SHAPING THE FUTURE OF MIZORAM

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Published by Sunil Sachdev and printed by Ravi Sachdev at Allied Publishers Pvt. Ltd., (Printing Division),
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New Delhi
2017
978-93-85926-49-5

Status of Freshwater Fishes of Mizoram

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Keywords: Ichthyology, Biodiversity Hotspot, Chelintripud, Invasive Species, Awareness

[illegible]

The work on fishes of Arunachal is still in its juvenile stage and only a little information has been available. Although studies have been conducted by different researchers from inside Mizoram (Barnes, 1959; Kumarajulu, 2005; Kar and Kar, 2007; Karimkar and Das, 2007), there is a lack of intensive survey works, particularly in the interiors of hills. There is a little topography and lack of proper language knowledge. Recent diversity research conducted by native scholars (Lalrunga et al., 2011) on the fish fauna of the Sittoung drainage (Lalrunga et al., 2011). Furthermore, the identification of some of the species recorded by these workers are doubted by subsequent authors (Ng and Lalrunga, 2009; a, b; Arangbam and Vishwanath, 2010; a, b; c; Darshin et al., 2011; Rameshtri and Vishwanath, 2012; a, c; Disha

During the last decade, 39 new species have been described from rivers of Mizoram (Angantshibi and Vishwathakshini, 2012; Ng and Lalramliana, 2010 a, b; Angantshobi and Vishwathakshini, 2012; a, b; Belfz *et al.*, 2011; Darshan *et al.*, 2011; Ng and Lalramliana, 2012; a, b; Lalramliana, 2012; Ramesh and Vishwathakshini, 2012; a, b; Lakshmi and Vishwathakshini, 2012; a, b; Dishna and Vishwathakshini, 2012; Ng *et al.*, 2013; Ng and Lalramliana, 2013; Lalrongngun, 2013; 2014; b; Lakshmi and Vishwathakshini, 2013; Dishna and Vishwathakshini, 2013; Lakshmi and Vishwathakshini, 2013; Sali *et al.*, 2014; 2014; Ng *et al.*, 2014 a, b; Lalramliana *et al.*, 2014 a, b, c; Arunachal, 2014; 2014; Lalramliana *et al.*, 2015 a, b; Dishna and Vishwathakshini, 2015; Ng *et al.*, 2016; Lalrongngun *et al.*, 2016).

This reveals that diversity of freshwater fishes of Mizoram is highly underrepresented and its ichthyofaunal inventory is far from complete, and the number of species is likely to

Lack of either documentation or scientific studies of an organism can highly decrease the effectiveness of conservation. This study gives information on the freshwater fishes of Mizoram, their endemism and their threat status. Data and literatures of earlier workers on the freshwater fishes of Mizoram were also reviewed.

Sampling was conducted from 2010 till date, from different drainages and their tributaries of Mizoram (Figure 1). Specimens were stored in 10% formalin and later transferred to 70% ethanol for longer preservation and deposited at Pachhunga University College Museum of Fish (PUCMF) and Zoological Society of India (ZSI). Counts and measurements were done for identification, and different procedures were

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Chapter 43

Epidemiological Study of Cervical Cancer in Mizoram

B. Lalnatsela and Lalpawinawha*

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ABSTRACT: Globally, among women, cervical cancer is the third leading cause of death from cancer after breast and lung. The etiology of cervical cancer may be infection, high parity, early age of first sexual intercourse, early age of first child birth, use of hormones and contraceptive medications, tobacco use, etc. However, the most common known etiology so far is the infection with human papilloma virus. According to National Cancer Registry Programme, Mizoram has one of the highest incidences of many forms of cancer among the states of India. Cervical cancer is a major health problem among the female population of Mizoram. However, there is no known epidemiological study on this subject in the state. The aim of the study is to assess the association between the risk of cervical cancer and demographic characteristics, menstrual and reproductive history and sexual history among the female population of Mizoram. A hospital based case-control study was performed during March 2015 to April 2016 at Civil Hospital, Aizawl and Mizoram State Cancer Institute, Zerbawak, Aizawl after obtaining ethical clearance from Mizoram State Ethical Clearance Committee. The study involved 163 histologically confirmed cervical cancer patients and 326 women free of any form of cancer acting as controls. A structured questionnaire was developed and included questions on demographic characteristics, reproductive, sexual and medical history, life style and dietary habits. An increased risk was found to be highest in early age at marriage (OR, 4.026, 95% CI, 2.589-6.620), those who had sexual activity before 17 years of age showed 3 folds higher risk than those having after 17 years. An increased risk was apparent among those who had children before 19 years (OR, 2.273, 95% CI, 1.492-3.462). Increased parity also showed an increased risk. The use of oral contraceptives (OR, 1.354, 95% CI, 0.735-2.496), chronic illness (OR, 1.488, 95% CI, 0.741-2.676), genital infection (OR, 1.226, 95% CI, 0.680-2.211), exposure to environmental tobacco smoke and tobacco consumption were associated with an increased risk of cervical cancer after adjusting for confounding variables and other co-variables. In conclusion, we have found that a higher risk of cervical cancer was observed among women who had an early age of marriage and among those who experienced early sexual intercourse.

Keywords: Cervical Cancer, Contraceptives, Mizoram, Parity

INTRODUCTION

Cancer is a major health problem all over the world. Cervical cancer is the fourth most common cancer among female, after breast, colorectal and lung and the seventh most common among male. Among women, it is the third leading cause of death from cancer after breast and lung cancer (Fertal et al., 2015). The etiology of cervical cancer may be infection, high parity, early age of first sexual intercourse, early age of first child birth, use of hormones and contraceptive medications, tobacco use, etc (Curick et al., 1999; Franceschi et al., 2003; International Collaboration of Epidemiological Studies of Cervical Cancer et al., 2007; Munoz et al., 2002; Munoz et al., 2002; Sazdovitch et al., 1996). However, the most common known etiology by far is the infection with human papilloma virus (HPV) (Daniel et al., 2005). Many studies had shown that 95% of cervical cancer involved infection with HPV (Haverkos et al., 2003). Some studies had correlated cervical cancer with either low

income family or countries (Coser et al., 2016; Dray et al., 2002).

The state of Mizoram located in the north eastern part of India is dominantly inhabited by the Mizo and in spite of its small population size it has one of the highest records of different forms of cancer not only in India but the world. The degree of cancer incidence among this particular ethnic group is rather fascinating. Although there are ongoing studies on the antitumor properties of certain floral varieties, only few researches on human cancer have been conducted in this state. Among the different districts in India, the district capital of Mizoram, the Aizawl district has the highest age adjusted rate of cancer in both males and females. Stomach, lung and cervix are the three most common cancer organs in Mizoram (N.C.R.P., 2013). However, there is no known epidemiological study on this subject in the state and we believe this is the first report on the epidemiological study of cervical cancer in this high cancer incidence population of Mizoram.

Science and Technology for Shaping the Future of Mizoram

Proceedings of the Mizoram Science Congress 2016

Edited by

Proceedings Sub-Committee, Mizoram Science Congress 2016

Organized by

Mizoram Science, Technology and Innovation Council (MISTIC)
Directorate of Science & Technology, Government of Mizoram



North Eastern Council (NEC)
Ministry of Development, North Eastern Region, Government of India

Science and Engineering Research Board (SERB)

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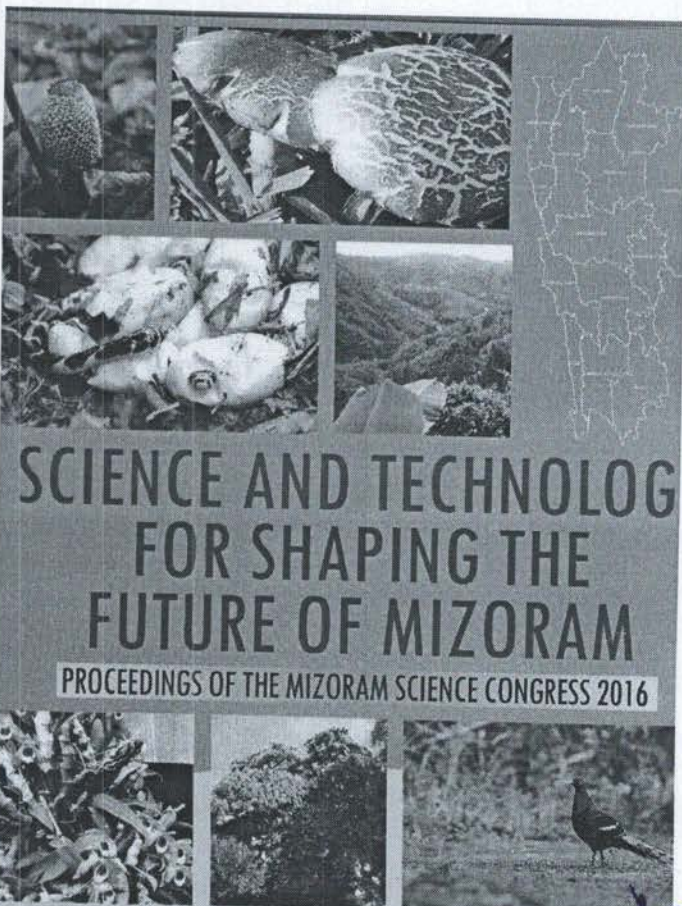
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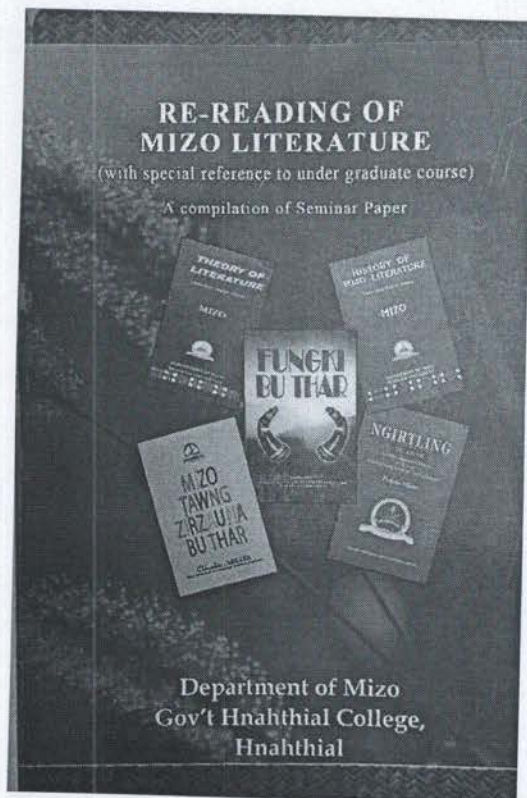
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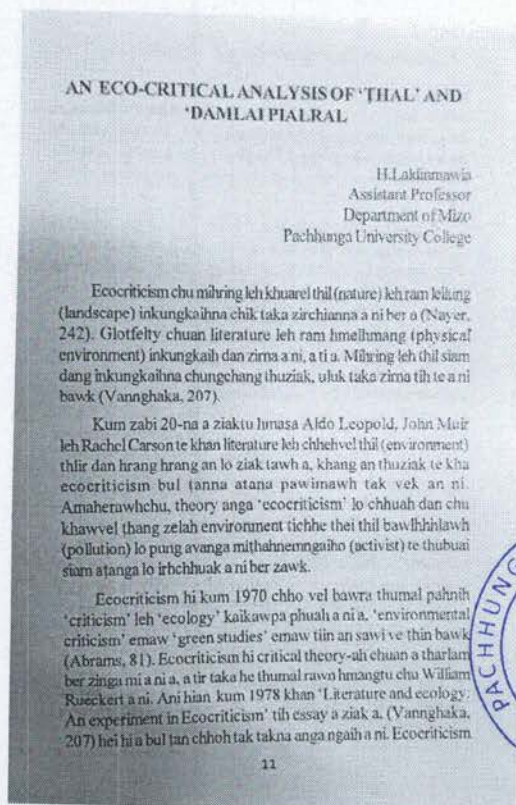
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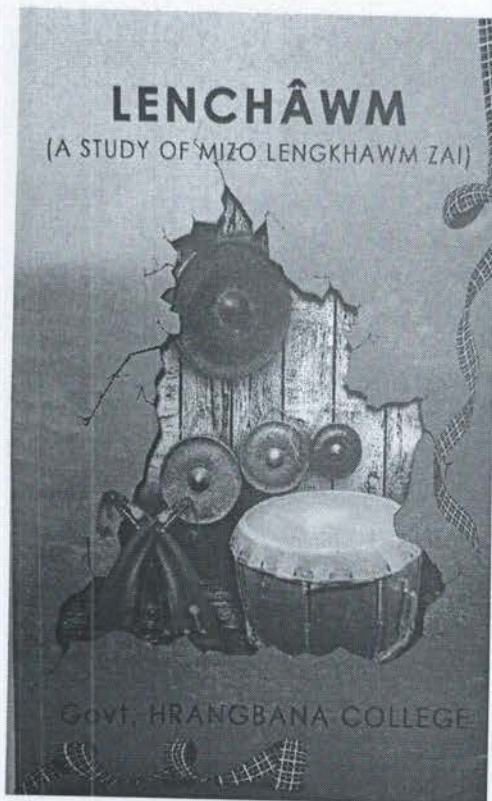


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SAIHUNNA 'HLA KHAWVEL' THLIRNA

(Saihnuna's Poetry from a Literary Point of View)

H.L. Laldinmawia
Department of Mizo
Pachhunga University College

'An leng dtal dial lungruai kimin
An awi Lalnunmema'

Mihring piang chhuak tawh zinga a tam ber hi chu hun hlui ngiaa lungleng thin an ni a. hmalam hun thileng tur thliu, duhtusam ram din chawp hmanga lungleng thin pawh an awm ve bawh. Hla phuahtu ropui Saihnuna (1896-1949) erawh hi chu he khawvel hmuh theih thil lamah nilovin, 'Chatuson Pialral/Van ram' ngaia lungleng thin, mi tlemte zinga ni a ni. Van ram chuan a lung a len satidhi mai a ni lova, a chhang phei chuan chu hmuna cheng ve ang hialin a inchan thin. A hla pumpui khawvelah hian 'Van ram' a ni ber a, chuwang chuan a hla hmangin khawvelah hian 'van nun' a chen a ni ber mai.

Saihnuna hlate:

Saihnuna hian hla 100 chuang zet a phuah nia rin a ni a (Lalrinthanga); thenkhat erawh chuan hla 98 a phuah a, chhang zinga hla 18 te chu kutziak ehhiar theih tawh loit a nih thu an sa bawh (Leng lai, iii). Siamkima Khawhling chuan, Saihnuna hla phuah, a fapa Lalchuan a ziaokchuan zawng zawng chu 77 a ni.

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ROKUNGA 'NATIONALISM'

H. Laldinmawia

Romantic poet leh critic hmingthang William Wordsworth-a'n hla chu 'Thil vet uasa lak atanga lo phul lami a ni' a lo tih hi thudika kan pawm a nih ngai chuan, thinlung chhungrila ram leh hnam hmangaihna fir, hla hmanga luanchhuahirtu Rokunga hi 'nationalist' tia chhal loh rual a ni lo. A hla phuah 128² kan hmuh theih zinga 16 3 zet hi 'ram ngai hla' (ram leh hnam hla) tia chhal chian ngam a ni a. Khuarel (nature) hla a phuah zawng zawng te hi 'nationalist rilru' siper atanga rawn irhchhuak ni hialin a ngaih theih bawik. Pathian thilsiam a fakna hla (nature poem) 22⁴ a phuah te hi chuk lehzualin han thil ila, a hla Jaimu-ah hian Mizoram, Mizo hnam, Mizo nunphung leh Mizo thil a ngaihhlutia kan hmuh thei deuh vek. Chutianga langsar taka Mizo thil hmuh tur awm mai lo te pawh chu han bih hnai leh deuh ila, Mizo rilrem zawng leh nunphung mila a phuah an la ni tho mai. Chuvang chuan a khuarel hla te pawh hi 'ram tana phuhmngaihna' rilru a put avanga tawn phul chhuak leh chutieng rilru min put thartir theitu an la ni cheu hlawn a ni.

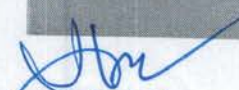
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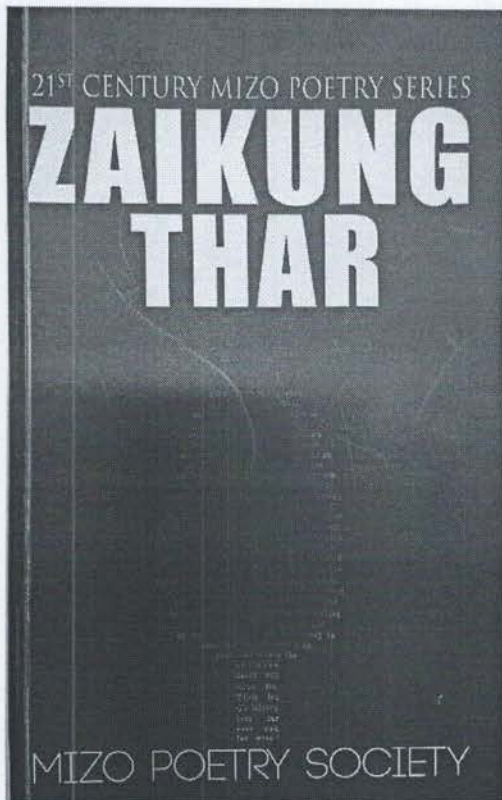
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— VANDUAI CHUANG THANGZAWRA —	
I	Lentu sawmfang hring nghilh nghialia'n, Kawlu chawi lawm lungrial, Leng Lalhnianga leh Thangzawra'n, Hlinton lo duang an thual.
II	Rambukthlan sawngka dawhsangah Hal lo leh lungrialin, Bialthu di an tiam ramdaiah, Ngur nun ngai lo rengin.
III	Saw hmartiang tukloh ram zauvoh, Tu chhin loh Lalhniangi, Val Thangzawra'n zuapa tawnah, A ngen e a thai turin.
IV	Tleitir sawilai kan ban nan, Thadang e Lalhniangi, Mi hlan u law Zawra thaia'n' An palain a ti.
V	'Kan hrai bungdawn tuaite, Liangang di ruah kan nuam, Thangzawra zuapa chengrang kha e, Sial ang min hlan pawt chuan'.



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2017

Educationist Press
an imprint of



Write & Print Publications
New Delhi-110 015

WRITE &
PRINT

Cataloging in Publication Data-DK

Courtesy: D.K. Agencies (P) Ltd. <docinfo@dkagencies.com>

National Seminar on 'Recent Advances in Natural Products Chemistry for Drug Discovery' (2015 : Udaipur, Tripura, India)

Natural products' chemistry / editor, Niranjan Das.

pages cm

Seminar papers.

Includes bibliographical references and index.

ISBN 9789386283542

1. Natural products--Analysis--Congresses. 2. Pharmaceutical chemistry--Congresses. 3. Pharmacognosy--Congresses. I. Das, Niranjan (Assistant professor (Chemistry)), editor. II. Netaji Subhas Mahavidyalaya (Udaipur, Tripura, India), host institution. III. Title.

QK861.N38 2015

DDC 547.7046 23

© 2017 Editor

ISBN: 978-93-86283-54-2

Publisher's note:

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Published by : Hitesh Mittal
For Write & Print Publications
H-13, Bali Nagar, New Delhi-110 015
Phone: 011-45635684; E-mail: info@writeandprint.com
Website: www.writeandprint.com

Laser Typesetting : Anshu Gupta, New Delhi
Printed in India.

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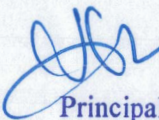
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Chapter 10

Study of Methanolic Extract of Flower of Wild Sunflower (*Tithonia diversifolia*) as Corrosion Inhibitors of Mild Steel in Acidic Medium

—JAY PRAKASH RAJAN* AND RAJ KUMAR MISHRA†

Introduction

Natural products are a rich source of bioactive compounds and it provided man with all his needs (food, fragrance, pesticides, fertilizers and medicine). In recent decades they have been a focus of the scientific community to develop value addition product such as anticorrosive agent for the prevention of metal degradation in corrosive medium. Compared to other methods of corrosion prevention such as chromate, phosphate and other inorganic agent, plant based natural derived corrosion inhibitors provide substantially better corrosion control at lower cost and require very easily availability rate. In light of the environment friendly materials are demands due to a growing of pollutant and these toxic materials in the environment constitutes a severe challenge for modern society (Anjali *et al.*, 2015). Approaches to alternative method to the employment of clean and more efficient technologies, which lowering the use of carcinogenic materials. One attractive way for existing plants derived natural product convert the unwanted greenhouse gas into valuable products.

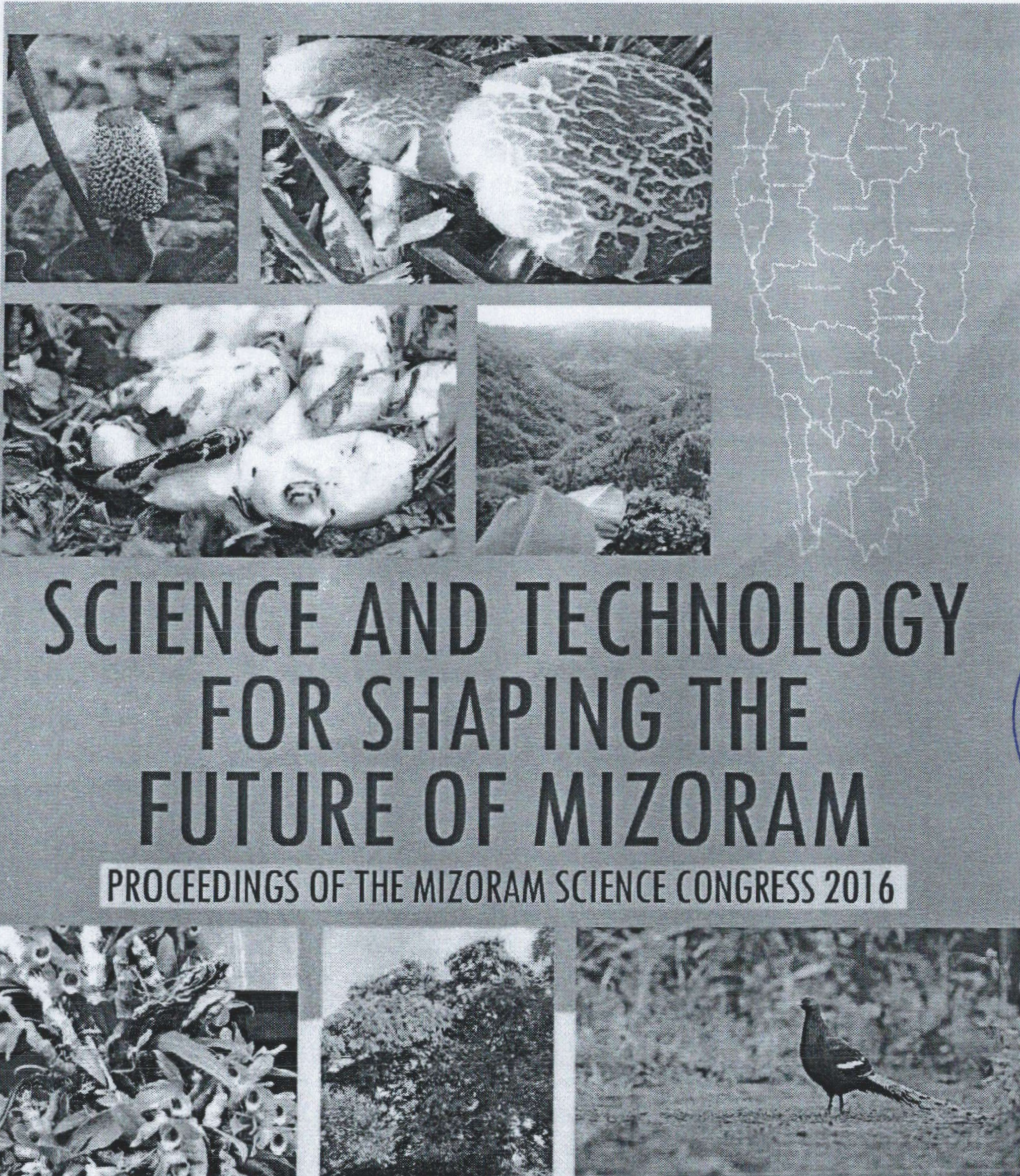
The purpose of this research works to provide an information to the presence of phytochemical active constituent in leave and flower of *Tithonia diversifolia* species and comparatively study of corrosion inhibition process of mild steel in acidic medium by using its methanolic extract. The intent

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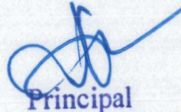
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Chapter 49

Chemical Constituents and Some Biological Properties of the Traditional Herbal Medicine *Acmella oleracea* (Asteraceae)

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ABSTRACT: *Acmella oleracea* is one of the most widely used traditional medicinal and culinary plants. It is easily available both in the wild and in cultivation. It is variously used in the treatments of anaemia, body ache, cancer, gastric ulcer and infections, gingivitis, gout, inflammations, laceration, malaria, stammering, and intestinal worm infection. The whole plant extracts were prepared with hexane, methanol, and chloroform. The methanol extract contained the most number of bioactive compounds, including carbohydrates, phytosterols, and tannins. The chloroform extract had carbohydrates and phytosterols. The hexane extract contained only phytosterols. The plant extract showed concentration-dependent scavenging activity of free radical, and has an almost the same antioxidant potency as that of the standard butylated hydroxytoluene (BHT). Two anthropo-pathogenic bacterial species, namely a Gram-negative *Pseudomonas aeruginosa* and a Gram-positive *Staphylococcus aureus*, were used for antibacterial activity. However, the plant extract failed to inhibit the bacteria in comparison to treatment with tetracycline. But there are reports of high activity against other species such *Bacillus cereus*, *Escherichia coli*, *Klebsiella pneumonia*, *Micrococcus luteus*, and different *Staphylococcus* species. The differential activity suggests that either the antibacterial principle is lost in the extraction or the antibacterial activity is species-specific. The study provided the evidence that *A. oleracea* possesses chemical components that are potentially useful in therapeutic applications.

Keywords: *Acmella oleracea*, Antioxidant Activity, Medicinal Plant, Antimicrobial Activity.

INTRODUCTION

Acmella oleracea (L.) R.K. Jansen is a rather small and perennial flowering herb belonging to the family Asteraceae. Considered to have originated from Peru, it is now introduced and now widely distributed throughout tropical and subtropical regions including Africa, America, Borneo, India, Sri Lanka, and Southeast Asia (Tiwari *et al.*, 2011; Prachayasittikul *et al.*, 2013). It is cultivated throughout the year as ornamental, culinary and medicinal plant. Its flowers and leaves produce a distinct pungent smell and irritating taste when chewed. It also produces a tingling sensation and numbness when rubbed against the skin. For this unique flavour, it is remains as an important vegetable and culinary additive. In the America, for its pungent flavour it is used as a spice. In India, Brazil, and Southeast Asia, it is a common vegetable (Lim, 2014). It is one of the most widely used medicinal plants in various ethnomedicinal systems because of its broad range of pharmacological properties including an aesthetic, anticonvulsant, antiseptic, antifungal, antiprotozoal, antidiarrhoeal, analgesic, antiulcer, antipyretic, antidiuretic, antiinflammatory, diuretic, aphrodisiac, and insecticidal

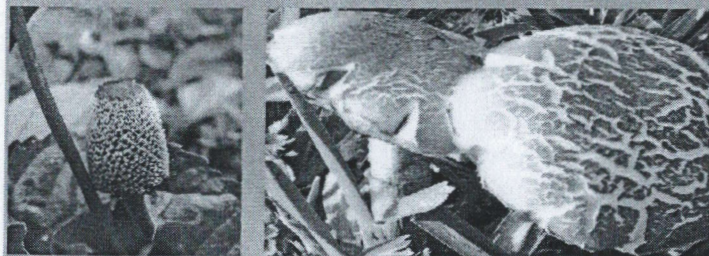
activities (Dubey *et al.*, 2013; Paulraj *et al.*, 2013). As antiseptic and pain-relieving agent, it has been employed in oral health care for the treatment of various mouth ailments such as gingivitis, oral ulcer, sore throat, and general toothache. For this reason, it has been earned a moniker toothache plant. These properties have been ascribed to the analgesic and antimicrobial activities of the plant (Chakraborty *et al.*, 2010).

A. oleracea is also applied in a curative of a number of infectious diseases and life-threatening afflictions such as blood diseases and bleeding, cancer, dysentery, gastrointestinal ulcer, rheumatism, and snake bite (Prachayasittikul *et al.*, 2009; Dubey *et al.*, 2013). In India and Africa, it is widely acclaimed as an antimalarial medication (Spelman *et al.*, 2011). It is used additionally in the treatment of gout, helminthiasis (intestinal infection), hepatitis, prostate cancer, scurvy, stammering, and xerostomia (dry mouth) (Duke, 2008). Its cytotoxic, antioxidant, and vasorelaxant activities have been confirmed indicating that there are good rationales for its use in the treatment of blood disorders (Prachayasittikul *et al.*, 2009). Its use in the treatment of high fever can be credited to the fact that it reported show antipyretic activity against Brewer's yeast-induced pyrexia (Chakraborty *et al.*,




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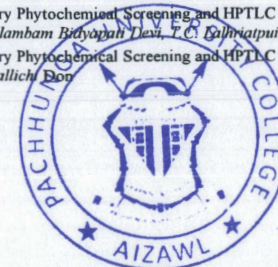
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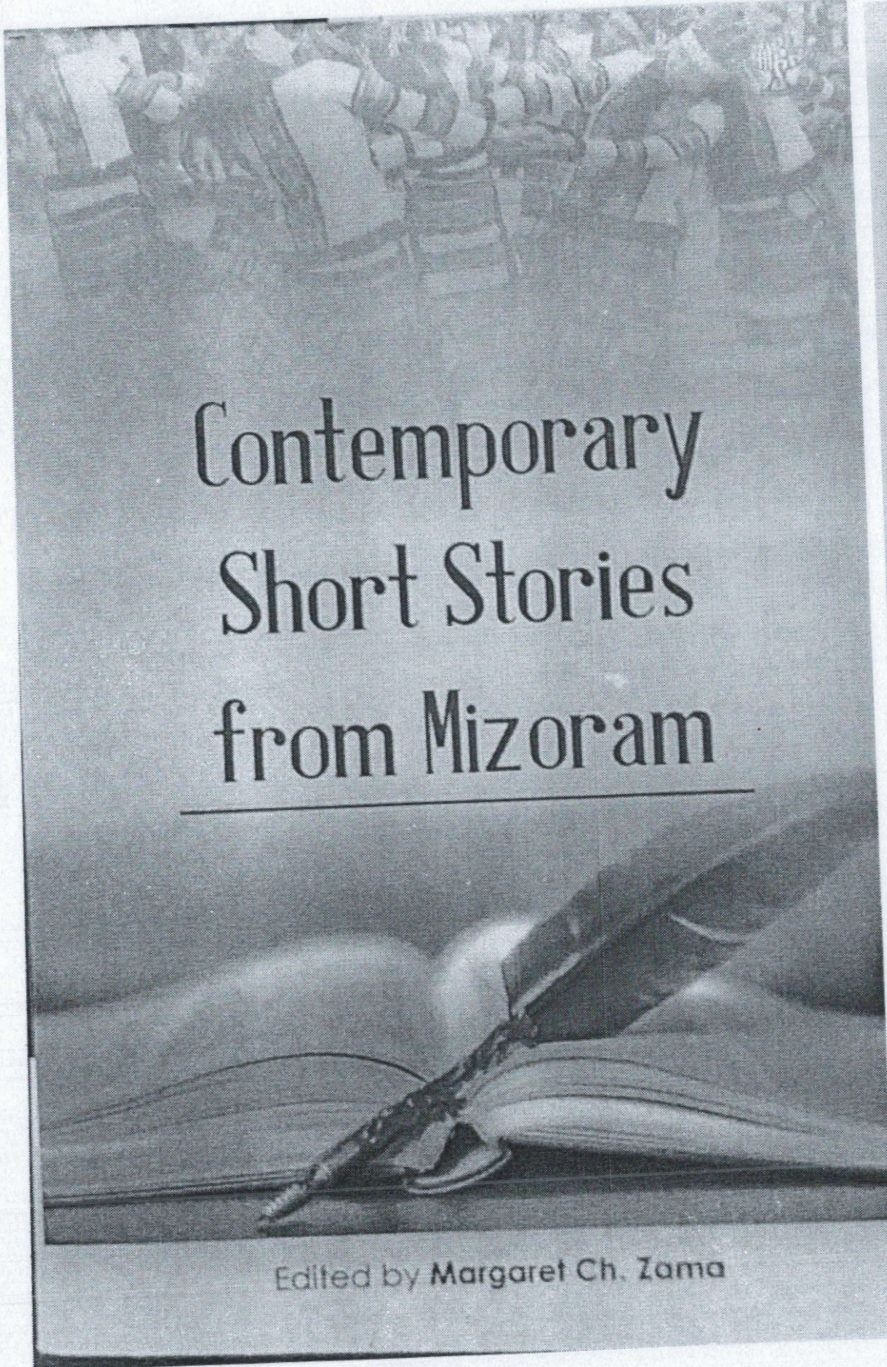
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Contemporary Short Stories from Mizoram

Edited by Margaret Ch. Zama

Contemporary Short Stories from Mizoram: An anthology of contemporary Mizo short stories edited by Margaret Ch. Zama, Sahitya Akademi, New Delhi (2017) Rs. 250

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Chennai Office

Main Guna Building Complex (Second Floor), 443(304) Anna Salai,
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First published: 2017

ISBN: 978-93-86771-45-2

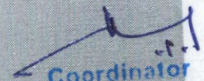
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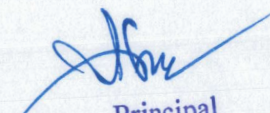
Cover design: Geetali Baruah

Pagesetting by Quick Offset, Delhi - 110 032

Printed at Sita Fine Arts Pvt. Ltd., New Delhi - 110 028




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Death's Dragnet

By Mafaa Haufnar

Most stories start at the beginning and concludes at the end. However there are some stories which have its beginning at the end. But in this story one cannot say, "It starts here and ends here", since it is not possible to know where it starts or where it ends. Therefore, I am just going to select a particular part from the many different events which took place in the life of Pu Thanga.

The first light of dawn had only just barely touched the earth but Pu Thanga's daughter had already lit the home fire for cooking. While cooking she pondered over the current politics of the time and the future of Zoram as much as she was capable of. Within the brief span of barely a month, news bringing terror and the unthinkable surfaced quickly one after the other. Bomb blast in Eiacru Veng, shooting at Solesuh, the Indian Army aided by jetfighters bombarding and scattering rebel volunteers, Lunglei SDO kidnapped, Champhai and Lunglei under the rule of the insurgents, volunteers occupying all key government offices in the entire southern region, war news that shocked and frightened everyone. The entire population was alarmed and in a state of panic particularly women and children so it was no surprise that Pu Thanga's daughter was worried and had much sleep over it.

She was still busy thinking about the current situation of the times and tending the fire when there was a knock on the door. Opening the door she found three persons standing and since she recognized that one of them was an old classmate at school she

unhesitatingly welcomed them at once. "What brings you to our home at such an early hour? Come inside, I'll pour tea for you."

The one she was thinking with said, "Is your dad not up yet? Our leaders want to ask him a few questions as we've come to invite him over to our place." At that instant one of them casually revealed his .32 beretta pistol tucked on his waist. One could not miss the fact that they were rebel Volunteers. Their catch phrase "We've come to invite him over to our place" actually meant "We've come to capture him."

Pu Thanga was a God fearing man, principled and broadminded and one who stood by his decisions. Though not of very large physique he most definitely did not lack courage nor physical strength since he once confronted and fought a wild bear! He was recruited by the Christian Mission as a primary school teacher. When the first political party of Mizoram the Mizo Union was founded he joined the party as the Mission did not object to its employees joining politics. He was appointed member of the Mizo Union Party Working Committee after which he quit his teaching profession as he became more actively involved. He eventually got elected as "councillor" which was the highest executive body in the party. As a result of this he understandably became one of the important targets for the underground MNI.

His daughter woke Pu Thanga from his sleep and informed him about his morning visitors. Though he was fully aware that this was not a courtesy call nor a friendly invitation, he was not even remotely afraid since he was confident that he has not done any harm to anyone. He tucked a *puan* (a mizo woven bag) under his arm and obediently followed the volunteers. Whilst he was leaving the house, his wife and other children had also woken up but none of them felt unduly worried. Before reaching very far Pu Thanga said, "I've forgotten to put on my watch, can I go back to fetch it?" The volunteers, on seeing his face, felt he wasn't the type to play tricks on them so they did not feel the need to provide an escort for him and thus gave him permission to go back alone. Had Pu Thanga wished to escape the Aizawl Rifles camp was but a short distance away and knew that if he fled to the camp they would have surely protected him.

Contemporary Short Stories from Mizoram : II

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Dad...

By Zirsangkima

It was mid September and the rain was still pouring incessantly. At times the weather was clear in the morning but would rain heavily at noon, and at other times it rained heavily in the morning but cleared out in the evening. It was that unpredictable time of the year when one often put on the wrong clothing.

Under the pleasant evening sky

"It's a holiday for me" said I since it was Saturday, and I took a siesta. I must have slept quite well because when I woke up it was already four in the evening. The weather was clear as I opened our bedroom window and felt refreshed and rejuvenated by autumn's lovely evening; the soft rays of the setting sun shone softly on our *khiang* (chilauni) tree giving me deep satisfaction within.

Children playing at our *kawmthlang*¹ were making a lot of noise. In an instant my son filled my thoughts. His birthday on 19 September was already next week. I wondered how we were to celebrate his birthday. At the same time, I also recalled some of the complex yet interesting questions my six year old often posed and how I tried to tackle them.

The difficult questions

To tell the truth, some of the questions he asks are difficult even for a full grown man to answer – "Dad, why doesn't God have a phone instead of having to pray to Him?" was one of them.

His mother and I often taught him about how every living being is created by God, and that everyone was created to love one another. We also taught him in ways he could understand that we should not look down upon the handicapped nor people more unfortunate than us, the poor and the needy but instead have pity on them; and how we should quietly tolerate and forgive even if others hurt or anger us. All these teachings appear to have had some impact on him too.

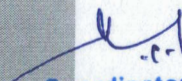
When we tell him these things he would often ask, "Dad, what should we do in order to love someone?" Other times he would come running home from school and without changing his clothes would come up to me and ask, "Dad, today our Miss beat Rema, does it mean that she doesn't love him? and she also added 'If anyone else is naughty I will beat them too'. Does she not love us?" I would try my best to explain how we sometimes need to be punished if it is for our own good.

I am inexperienced in raising a child; many times I find it very difficult. But, I know that there is nothing that can make me more happy, or help me lead a changed life, than my son. He is very precious to me, and he will continue to grow more precious. Sometimes when I think about the questions Bawihpuia asks me, I feel that he is attempting to find the beauty of life in others.

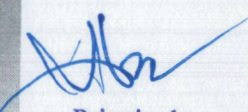
Is'nt life beautiful?

I washed my face to refresh myself and walked up to our terrace where the sun was starting to soften its rays. Bawihpuia's mother was watering the vegetable plants and flowers. The ficus plant that Bawihpuia and I had planted in the month of April was starting to produce tender shoots, its young leaves swaying as the soft cool wind blew against them and the setting sun cast its glint upon them. I felt that all the things I witnessed were displaying 'the most beautiful thing' that they possessed, to me. I helped carry water for Bawihpuia's mother. I imagined that the mustard plants dancing to the wind were telling me several things.

While listening to our favourite song 'You belong to me' by Bob Dylan we started planning on how to celebrate Bawihpuia's birthday and my birthday just the day after. Sometimes we cracked


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STAM CONSULTANCY PROJECT

STUDY AND SURVEY OF PLASTIC BAG USES WITHIN AIZAWL MUNICIPAL CORPORATION AREA

Dr. LALDINPUIA

Dr. R. LALENGMAWIA

LALRINTHARA PACHUAU


Coordinator
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CONSULTANCY PROJECT
**STUDY AND SURVEY OF PLASTIC BAG USES WITHIN
AIZAWL MUNICIPAL CORPORATION AREA**
(SUBMITTED TO AIZAWL MUNICIPAL CORPORATION)

Project Investigators

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MANZAMAWII, M. Sc. (EVS) & B. SANGA, M. Sc. (Stat.)

On behalf of
SCIENCE TEACHERS' ASSOCIATION MIZORAM (STAM)

[Cited as: Laldinpuia, Lalrinthara Pachuau, Manzamawii, B Sanga & R Lalengmawia (2017): Study and Survey of Plastic Bag uses within Aizawl Municipal Corporation Area, AMC- STAM: Aizawl]

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First published: June, 2017

ISBN: 978-81-933676-4-3

Printed at TM Offset Press, Aizawl, Mizoram: 796001

Copies: 100


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UNIT-I

EXECUTIVE SUMMARY

Study and survey of plastic bag uses was conducted for Aizawl Municipal Corporation as per agreement made on 1st December 2016. The 50th Governing Body of STAMmazing constituted the consultancy study group from the Governing Body members, and appointed Dr. Laldinpuia, Assistant Professor of Pachhunga University College for *Principal Investigator*, and two Co-PIs: Dr. R. Lalengmawia, Associate Professor of Govt. Zaria Residential Science College and Pu Lalrinthara Pachuau, Assistant Professor of Pachhunga University College, respectively.

The Consultancy Group was supported by two JRFs: Ms. Manzamawil, M. Sc. (EVS) and Mr. B. Sanga, M. Sc. (Statistics) for 15 months; and assisted by 15 graduates as *Field Assistants* (F.A.) for one month. Open advertisement notified through leading newspaper for these supporting staffs, and are selected on their performance in group interview. The Consultancy Group trained, monitored and supervised all their activities regarding their studies and surveying practices.

Questionnaire and local vendors surveying started on 10th December 2016 and submitted reports on 15th February 2017. Thermoplastic cups and plates consumed by churches (reported as Group) during Christmas and New Year celebrations also included.

The study covers all 19 wards within Aizawl Municipal Corporation area. Surveying and collection of questionnaire was done by 15 field assistants. Environmental impacts and dumping ground studies, compilation and statistical analyses were done by JRFs.

Results of plastic bag uses in ward-wise of AMC area plotted using ArcGIS software based on IRS Quickbird 2016 data; and statistical data output carried out after SPSS and Excel software.



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**PROCEEDINGS OF
2017 INTERNATIONAL CONFERENCE
ON PUBLIC ADMINISTRATION (12th)
& INTERNATIONAL SYMPOSIUM ON
WEST AFRICAN STUDIES (1st) (Volume I)**

November 14-17, 2017

Accra & Cape Coast, Ghana

Editors in Chief

TANG Zhiwei

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Co-Sponsored by

University of Ghana (UG), Ghana

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American Society for Public Administration (ASPA), USA

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Designing Editor: Zhang Qin Wu Yanling
Executive Editor: Wu Yanling

Published by
University of Electronic Science and Technology of China Press (UESTC Press)
Add: No. 159 Electronic Information Building, Eastern Section One, Ring Road One, Chengdu
Postcode: 610051

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(UESTC Press)

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Proceedings of 2017 International Conference on Public Administration (12th) & International
Symposium on West African Studies (1st) (Volume I)

Editors in Chief: TANG Zhiwei ZHAO Shurong

Http://www.uestcp.com.cn

E-mail: uestcp@uestcp.com.cn

Publisher: Xin Hua Book Store

Printed by

The Printing House of Chengdu Jinlong Co., Ltd.

Format 185mm×260mm Printed Sheet 64.5 Words Quantity 2 040 000

First Edition: October 2017

First Printing: October 2017

ISBN 978-7-5647-5222-4

A Set Price: RMB 980.00


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Urban Solid Waste Management System and People's Participation in Aizawl City

1. Lalnchizovi, 2. H.C. Lalehhuawma
1. Mizoram University, India, 796004
2. Pachhunga University College, India, 796001

Abstract Mizoram is one of the most urbanized states in India. The higher rate of urbanization brings about a challenging task to the service delivery agencies. Sanitation effort has started under the Mizo District Council (MDC) and activities were gradually intensified with the Union Territory and State Government and now ultimately driven by the urban local body, i.e. Aizawl Municipal Corporation backed by the 74th Constitution Amendment Act (CAA). Solid Waste Management (SWM) in Aizawl, since 2009 has been managed through modified public-private partnership mainly based on a quantum of people's participation. Local Councils are engaged in the collection and disposal of waste. Urban governance is facing numerous challenges in solid waste management system—due to its topography, only 80.44 per cent of households have participated in the PPP mode and the rest 16.73 per cent are out of its purview. Hence, the question is how far has Solid Waste Management system through PPP mode a success in Aizawl? The study explored and analyzes the status of people's participation in SWM in Aizawl.

Key words Solid waste management, Urban, People's participation, Aizawl, Mizoram

1 Introduction

India's urban population is 31.16% and rural population is 68.84% as per Census 2011. Among the 29 states, Mizoram has become one of the most urbanized states. Next to the state of Goa, it has the highest proportion of urban population in India. Mizoram population is 1,097,206 out of which the urban population constitutes 52.11 and rural population comprises 47.89 per cent (Census, 2011). There are 23 notified towns and the total urban population is 571,754 making the state having more urban to rural population. Aizawl, the capital city of the state's population also achieved growth from 74,493 in 1981 to 293,416 in 2011 which constituted 26.74 per cent of the entire state population and 51.32 per cent of the total urban population in Mizoram.

Mizoram is a land of rolling green hills and steep slopes situated in the Northeast India. Mizo categorised as Scheduled Tribe (ST) make up 94.6% of its population. The state is characterised by remoteness along three dimensions and these have played an important role in shaping its development trajectory and its identity (Kamath & Waingankar, 2015). The first is physical remoteness due to its topography consisting of thick forests, steep slopes and heavy rainfall. The second is remoteness engendered due to poor infrastructure with only a single major road transport link to the Indian Union via National Highway 54 that connects the capital city of Aizawl to Silchar in Assam, Shillong in Meghalaya in the north, Churachandpur in Manipur in the northeast, and Agartala in Tripura. The final dimension is remoteness in terms of imagination, situated as it is at the edge of the nation. It is the southern most of the Northeastern states with three quarters of its boundary being an international one, shared with Myanmar and Bangladesh.

2 Aizawl-Capital City of Mizoram

Aizawl is the capital of Mizoram and is one of the eight North Eastern States in India. It is geographically located between latitude 23°43'38"N and longitude 92°43'04"E. It was established on 25th February 1890 as a fortified place and a military outpost of the British and it was colonised until 1947.

RE-READING OF MIZO LITERATURE

(with special reference to under graduate course)

A compilation of Seminar Paper



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TRAUMA STUDY IN LALZUITHANGA'S 'PHIRA LEH NGURTHANPARI'

Lalrammuana Sailo
Research Scholar
MZU

1. Thuhmahruai

'Trauma' tih hi Greek tawng atanga lak niin 'hliam' (a wound or an injury) tihna a ni a. *Encyclopaedia Britannica* chuan "thil thleng eng emaw avanga rilrua hliam awm" tiin a hrilhfiat a (*Encyclopaedia Britannica*).

Trauma kan tih chu thil tha lo emaw chhiatna lo thleng (original event) ringawt kha ni loin chu thil thleng chu tute emaw ngaihtuahnaa cham zuiin chu chuan rilru leh nunphung a nghawng zui thin. Cathy Caruth chuan hetiang hian trauma nihphung a sawi a: "Trauma is not locatable in the simple violent or original event in an individual's past, but rather in the way that its very unassimilated nature- the way it was precisely not known in the first instance - returns to haunt the survivor later on" (Unclaimed Experience, 4).

Trauma thlentirtu hi chi hrang hrang a awm thei a; indona vang te, tampui mitthi vang te, mipat hmeichhiatna lama innghaisakna vang te, mimal zahawmna palzut leh rahbeh sak vang te, chi leh chi, sakhua leh sakhua inenhranna vang te leh chhan hrang hrang vangin mihringah tuarna a lo awm thin a. Chu an thil tawrh chuan hliam leh ser neiin a tuartute nun ram chu a khawih zui fo. Chutih rualin a ehhe lama thil thleng zawng zawngin trauma a thlen kher lo a. Rilru lama tuarna a nih avangin a tuartu mihring a zirin a thawhdan a inang lo thei a. Thil thleng inang rengah pawh a tuartu a zir thoin an tuar nat zui dan a danglam thei. Mihring nuna *trauma* a lo thlen chuan an dinhmun hreawm tak atang chuan an tunhma nun ralmuang leh hlimawm tak chu an chhui kirin an tun hun nen an khaikhin thin a, chu chuan an rilru a tina zual thin a ni.

Literature huanga *trauma* zirna hi a la tharlam ang reng hle a Elissa Marder chuan a thuziak pakhat *Trauma and Literary*



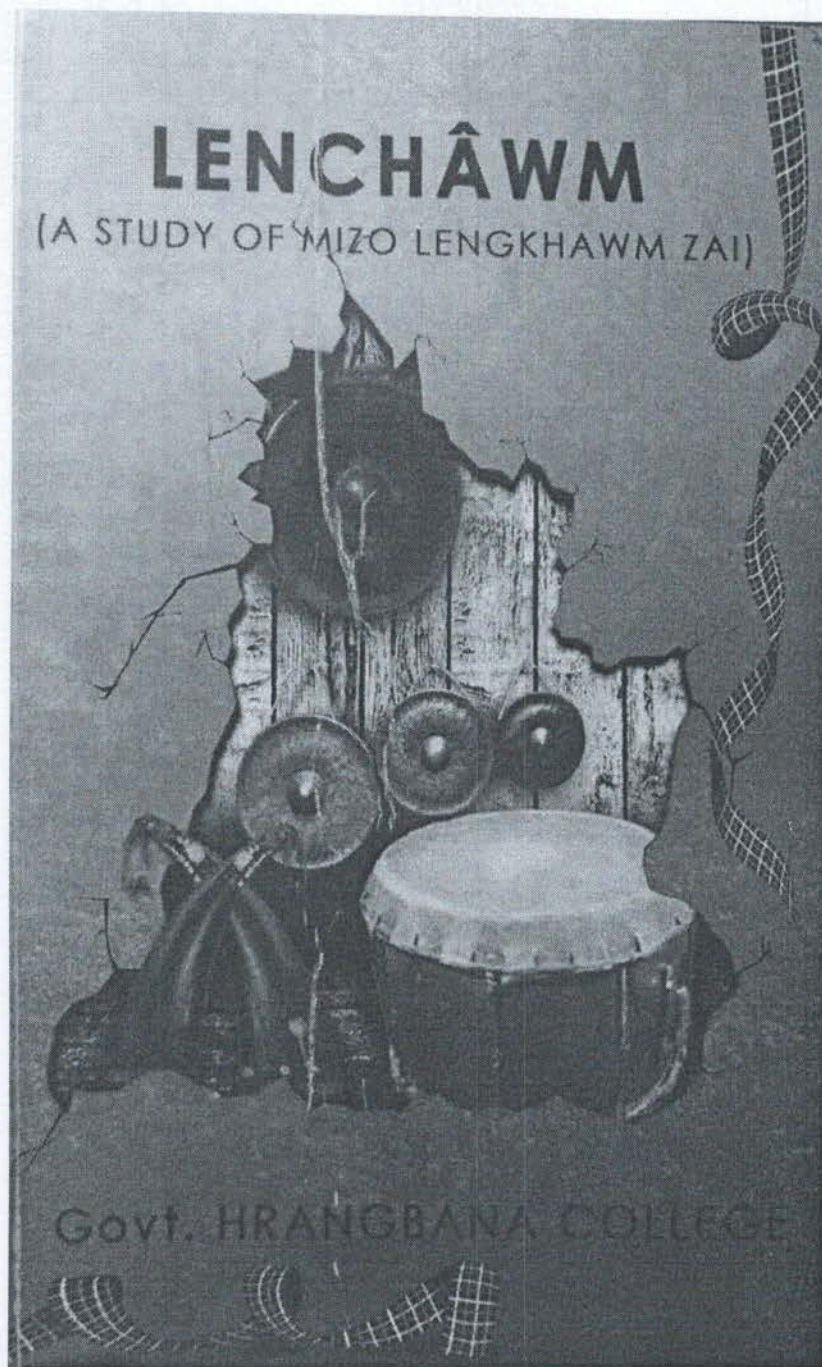
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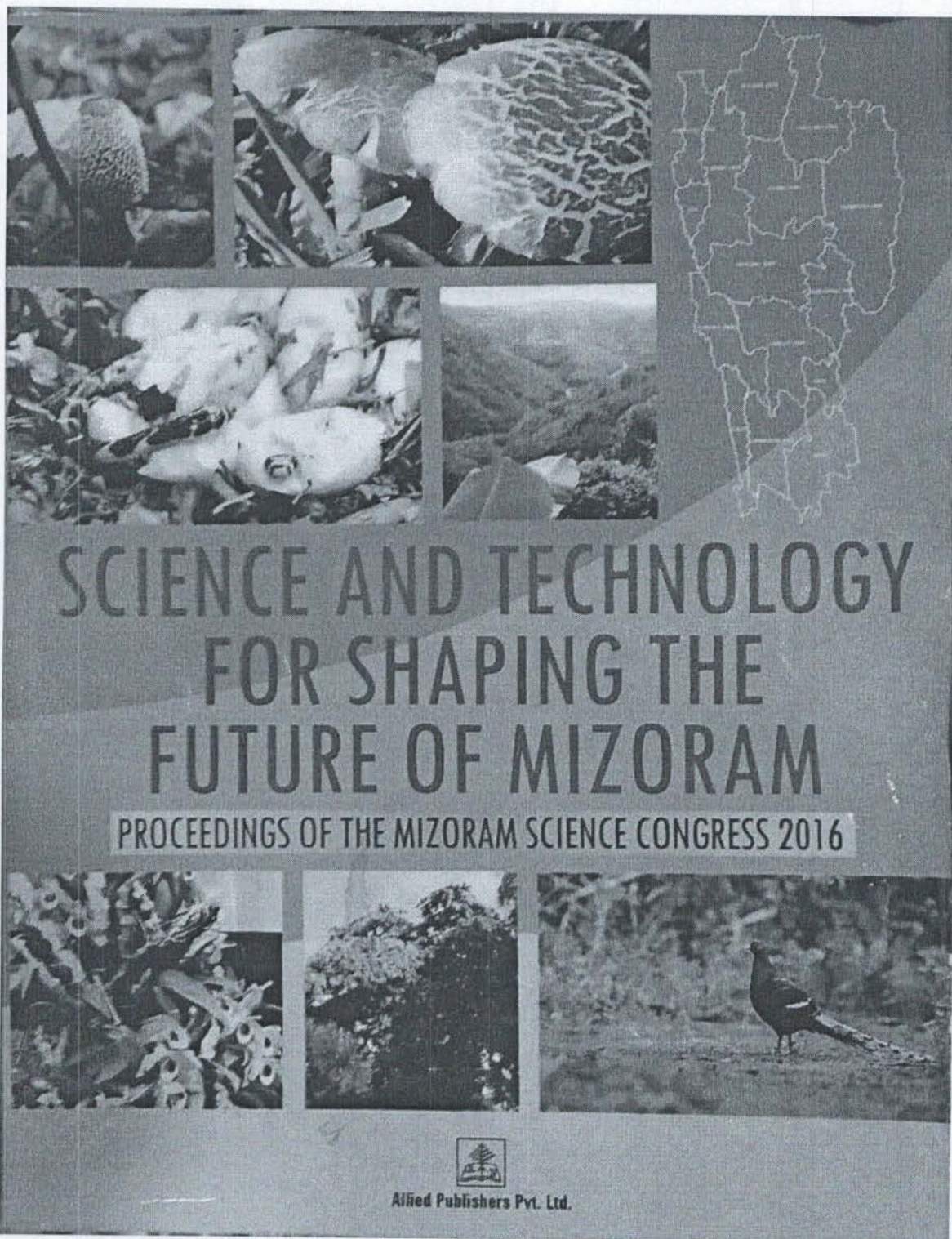
The Influences of Environmental Determinism in Lengkhawm Zai with Special References to Awithangpa and R.L. Kamlala

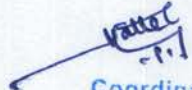
- Lalrammuana Sailo
Research Scholar, MZU

1. Thuhmahruai:

Environmental Determinism hi mihring leh a chenna maichin dan zirna a ni a; ram leilung leh sik leh sain a chhunga chengte nunphung leh hmasawna, an rilru puthmang leh an lawihera nghawng a neih dan zirna a ni.

Mihring leh a chenna ram leilung inzawm dan hi chiang taka sawi fak har viau mah se, vun rawngah te, hmel leh pian phungah te, hmasawna kawng, rilru puthmang, lunglen zawng leh tuipei zawngah te awmzia a neih tih erawh a chiang a ni. Mizoram khuate duhmun hriatchian leh tlawhpawh tam zawng ringawtah pawh kan awmna khua a zirin kan paltlang tamin kan paltlang tlem hlei hle a ni. Entirnan, Siaha khaw mi Aizawl-a College leh University kal chuan Aizawl a panna kawngah Lawngtlai, Lunglei, Serchhip, leh Aizawl District khaw tam tak arawn paltlang a; Kolasib tlang dung chu vai ram zinkawng a ni baw. Kolasib khaw mi Aizawl College leh University kalte erawh an chenna District leh Aizawl District pak pel lovin College leh University an chhuak thei. Chutichuan kan chenna khua chuan kan briatna, kan finna leh kan hausakna tlangin kawngro a su thei a ni.




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Dynamical System—Linear, Non-Linear, Chaos and Some Models of Dynamical System

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INTRODUCTION

A dynamical system is that whose evolution from a prescribed initial state (condition) can be given by some rule(s). Such rules must be written in the form of mathematical equations viz. Algebraic equation, Integral equation, Differential equation etc.

Thus a dynamical system has two important ingredient:

1. An initial state (or initial condition) which specifies from where the system starts evolving.
2. Rule(s) which specifies how the system is evolving.

Therefore we see that a dynamical system is nothing but a mathematical model which evolves under certain rule starting from a prescribed initial position or condition. Problems on dynamical system:

1. Given an initial value x_0 , we like to know how it evolves i.e. we like to know its behaviour in long term evolution.
2. What is the orbit of x_0 ? Whether such an orbit is stable or unstable.
3. What are periodic orbits?
4. How bifurcations are taking place during evolution.
5. What are fixed points, periodic points, limit cycles etc.
6. How a regular system evolve into a chaotic system and vice-versa?
7. Regarding stability of fixed points.

In general, there are two types of dynamical system:

(i) **Discrete Dynamical System** represented by differential equation as $x_{n+1} = f(x_n)$, $x_0 = x(0)$.

Here time is an integer variable. For a given initial starting point x_0 , we obtain under this rule f

$$x_0, x_1 = f(x_0), x_2 = f(x_1) = f(f(x_0)), \\ x_3 = f(x_2) = f[f(f(x_0))] \text{ or } x_0, x_1, x_2, x_3, \dots$$

This sequence is called orbit of x_0 under rule f and the process is known as iteration process of x_0 under rule f .

Example: $f(x) = 2x^2 - 3$, $x_0 = x(0) = 0$, $f(x_0) = -3 \rightarrow x_1$,
 $f(-3) = 15 \rightarrow x_2$, $f(15) = 2(15)^2 - 3 = 447 \rightarrow x_3, \dots$

(ii) **Continuous Dynamical System** represented by differential equations $\frac{dx}{dt} = f(x, t)$, where time is involved explicitly.

$\underline{x} = (x_1, x_2, x_3, \dots)$ and $\underline{f} = (f_1, f_2, f_3, \dots)$

Now if $\underline{x} = (x, y)$ and $\underline{f} = (f, g)$

Then it follows that $\frac{dx}{dt} = f(x, y, t)$ and $\frac{dy}{dt} = g(x, y, t)$

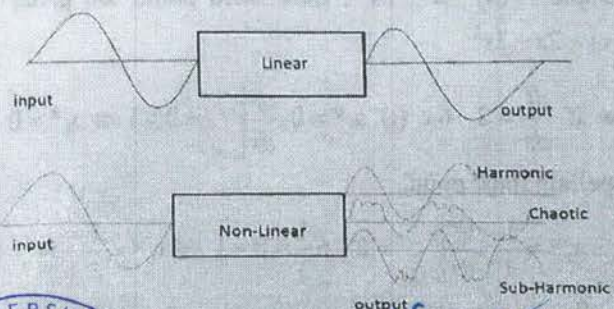
Classification: Dynamical system is classified into Linear and non-linear dynamical system. If the dynamic rule of the system is proportional to the system variable, then the system is linear. Otherwise non-linear. To have a better concept, suppose we apply a force F to produce a displacement x . If we double the force $2F$ and if the displacement produces is $2x$, then the system is linear. To have a mathematical definition, any operator L is called linear if:

$$L(\alpha u + \beta v) = \alpha L(u) + \beta L(v) \quad \dots (1)$$

for $u, v \in V$ (vector space) and $\alpha, \beta \in \mathbb{R}$ (scalars)

If L is differential operator satisfying eqn. (1), then any equation $L(u) = 0$ is called a linear differential equation.

In a linear system, if input is periodic then output is also periodic. In case of non-linear system if input is harmonic, output may be harmonic, chaotic or sub-harmonic.



FIXED POINTS (LAGRANGIAN OR EQUILIBRIUM POINTS)

Definition 1: For a discrete system $x_{n+1} = f(x_n)$, $x_0 = x(0)$, or $y = f(x)$. Fixed points are the solution of the equation $x = f(x)$.

Example: Suppose $f(x) = x^2 + 3x + 2$. Fixed points are given by $x = x^2 + 3x + 2$

$$\Rightarrow x_1 = -1 + i, x_2 = -1 - i$$

Definition 2: For continuous system $\frac{dx}{dt} = f(x, t)$, the fixed points are solution of the equation $\frac{dx}{dt} = 0$ or $f(x, t) = 0$

Example: $\frac{dx}{dt} = x^2 + xy + 2y^2$, $\frac{dy}{dt} = x - xy^2$, $x = (x, y)$. Fixed points are solution of the equation $x^2 + xy + 2y^2 = 0$ and $x - xy^2 = 0$, or $x(1 - y^2) = 0 \Rightarrow x = 0$ or $y^2 = 1$, $y = \pm 1$.

Thus fixed points are $(0, 1)$, $(0, -1)$.

Stability of a Fixed Point: A fixed point of a dynamical system is said to be stable if all sufficiently small perturbation from it damp out in time. i.e. if a small perturbation given to the system after sometime the system returns to its original fixed position. A stable fixed point is called an attractor because all nearly trajectories have the tendency to move towards it. An unstable fixed point is called a repeller. Let x^* be a fixed point of the dynamical system $x_{n+1} = f(x_n)$ or $y = f(x)$.

We say that $(1) x^*$ is stable or attracting

$$\text{if } \left| \left(\frac{df}{dx} \right)_{x=x^*} \right| < 1 \text{ or } \left| \frac{x_1 - x^*}{x_0 - x^*} \right| < 1$$

$$(2) x^* \text{ is unstable or repelling if } \left| \frac{x_1 - x^*}{x_0 - x^*} \right| > 1$$

$$(3) x^* \text{ is neutral if } \left| \frac{x_1 - x^*}{x_0 - x^*} \right| = 1$$

Example: $f(x) = 2x - 3x^2$. Here fixed points are given by $f(x) = 2x - 3x^2$

Now if $\frac{df}{dx} = 2 - 6x$ (i) $x_1^* = 0$, $\left. \frac{df}{dx} \right|_{x=0} = 2 > 1 \Rightarrow x_1^* = 0$ is a repelling fixed point.

(ii) $x_2^* = \frac{1}{3}$, $\left. \frac{df}{dx} \right|_{x=\frac{1}{3}} = 2 - 6 \cdot \frac{1}{3} = 0 < 1 \Rightarrow x_2^* = \frac{1}{3}$ is an attractor or stable fixed point.

Classification of Stability: If at a fixed point we observe $\dot{x} > 0 \Rightarrow x$ is increasing with time t . We indicate it by an arrow written as $\rightarrow$ and for $\dot{x} < 0$, we use another arrow written as $\leftarrow$. We make the following classification of stability:

1. We say a fixed point x^* is Lyapunov stable if all trajectories originating nearby it remain sufficiently close to it.
2. When a fixed point x^* is Lyapunov stable but not attracting, it is called neutrally stable.
3. If a point is both Lyapunov stable and attracting, it is called stable or asymptotically stable.
4. A fixed point x^* is unstable or repelling, if it is neither Lyapunov nor attracting.

Example: $\frac{dx}{dt} = \dot{x} = x^2 - x - 2$. Fixed points are:

$$x_1^* = 2 \text{ \& } x_2^* = -1.$$

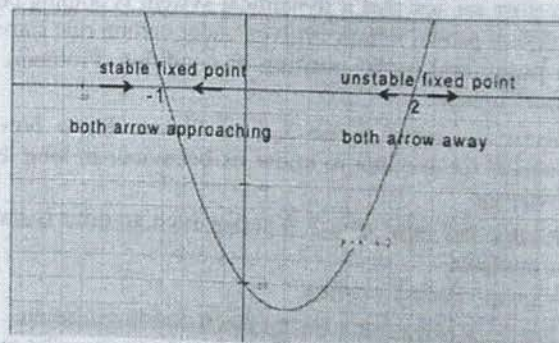
Tracing the curve of $y = x^2 - x - 2$. If $y = 0$, $x = 2$ or -1 .

Also if $x = 0$, $y = -2$

As $\dot{x} = (x-2)(x+1)$.

We see that:

1. for $x > 2$, $\dot{x} > 0$ and represent it as $\rightarrow$
2. for $0 < x < 2$, $\dot{x} < 0$ and represent it as $\leftarrow$
3. for $-1 < x < 0$, $\dot{x} < 0$ and represent it as $\leftarrow$
4. for $x < -1$, $\dot{x} > 0$ and represent it as $\rightarrow$



Some Models of Dynamical System

1. From Finance: Let us consider a deposit in a Bank with 10% p.a interest. Let A_0 be the initial deposit. Then after one year, we add 10% of A_0 to A_0 to get A_1 . Thus

$$A_1 = A_0 + (0.1) A_0 = (1.1) A_0. \text{ At the end of the second year, we perform the same operation and get } A_2 = A_1 + (0.1) A_1 = (1.1) A_1 = (1.1)^2 A_0. \text{ Similarly } A_3 = A_2 + (0.1) A_2 = (1.1) A_2 = (1.1)^3 A_0$$

$A_n = (1.1)^n A_0$. Thus we are getting a process of iterations or a dynamical system with initial value A_0 and the rule of dynamical system is to multiply by (1.1) every year to the previous year's deposit. In functional form, we can write this dynamical system as $F(x) = (1.1)x$. Then applying iterations with $x_0 = A_0$ we get.

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$$A_1 = F(A_0) = (1.1)A_0$$

$$A_2 = F(A_1) = F(F(A_0)) = F^2(A_0)$$

For example if $A_0 = ₹ 1000/-$, then after 5 years, $A_5 = (1.1)^5 \times 1000 = ₹ 1610.51/-$

after 10 years, $A_{10} = (1.1)^{10} \times 1000 = ₹ 12593.74/-$

after 50 years, $A_{50} = (1.1)^{50} \times 1000 = ₹ 117390.85/-$

II. Models from Ecology (unrealistic population model):

Let us denote the population of a certain species at generation n . Our question is can we predict what happens to as n increases? The simplest form of dynamical system for population of any species can be written as $P_{n+1} = rP_n$, where $r = \text{constant}$ interpreted as growth or decay rate which can be determined by ecological conditions. Thus if P_0 be the initial population, we can determine the population at any generation as follows:

$$P_1 = rP_0, P_2 = rP_1 = r^2P_0, P_3 = rP_2 = r^3P_0, \dots, P_n = rP_{n-1} = r^nP_0$$

We notice that the ultimate fate of the population depends on the growth rate r :

1. If $r > 1$, then $r^n \rightarrow \infty$ as $n \rightarrow \infty \Rightarrow P_n \rightarrow \infty$

2. If $r < 1$, then $r^n \rightarrow 0$ as $n \rightarrow \infty \Rightarrow P_n \rightarrow 0$

3. If $r = 1$, then $r^n = 1 \Rightarrow P_n = P_0$

However, this simple population model is highly unrealistic as the real-life population behave in a much more complicated manner.

III. Logistic Model (More realistic population model): In case of realistic population model we have consider the following points:

1. There is some absolute maximum population that can be supported by the environment. If the population reaches this number, then we have disastrous overcrowding. Food supply becomes critically short and the species immediately dies out.
2. To keep the number manageable, we assume that P_n represents the fraction of this maximum population alive at generation n so that $0 \leq P_n \leq 1$. The model for the population thus explained can be represented by $P_{n+1} = \lambda P_n(1 - P_n)$. Here λ is again a constant representing the growth/decay rate under ecological conditions. For various reason, we always assume $0 < \lambda < 4$ to express natural and regular evolution of the population. Otherwise once $\lambda > 4$, the population evolution will show randomness and unpredictability which is termed as 'chaos'.

Also we note that the fraction $(1 - P_n)$ in the unrealistic model for r expresses some reasonable growth or decay. The second model implies the iterative Logistic map. The model can be written in functional form as $f(x) = \lambda x(1 - x)$. This is a non-linear model and it has large application in various branches of science, energy, medicine, social sciences, economics etc in every area of knowledge.

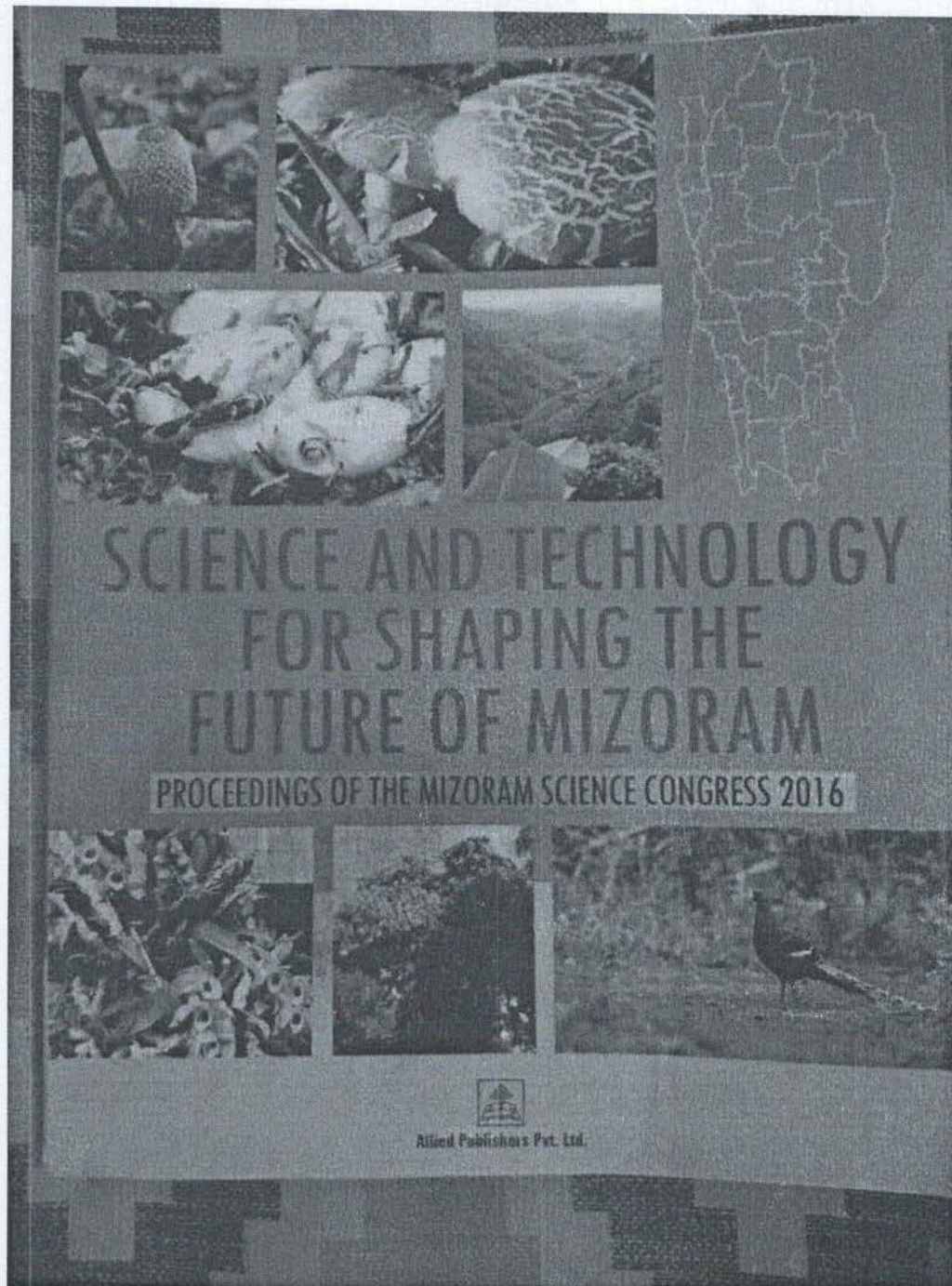
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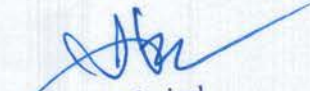

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Chapter 33

Geotechnical Studies of Bawngkawn Landslide, Aizawl District, Mizoram

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ABSTRACT: The Bawngkawn landslide area is 5.5 kms from Aizawl town on the Aizawl-Lunglei road. It covers length 250 m, height 150 m and width 25 m. Sandstones, shales and siltstone-shale alternations are the main components. It is a highly unstable layer, and instability in the area seems from the intersection of three sets of joints dividing the rock beds into blocks of varying dimensions. Rocks excavation and repeated blasting in the past could be major factors. Improvement of drainage, retaining walls along the roadside, and prohibition of further construction are suggested.

Keywords: Landslide, Bawngkawn, Sandstones, Shales, Siltstone, S.H.E. Drainage

INTRODUCTION

The slided area (Lat 23° 45' 30" N and Long 92° 44' 13" E) is located at about 5.5 kms from Aizawl town (about 700 m from Bawngkawn police point) on the Aizawl-Lunglei road (NH 54) (Plate 1 and 2). The area belongs to western aspect of the NW-SE trending hill range in Bawngkawn locality and forms a part of the Survey of India Toposheet nos. 84 A/9 and A/10. A road passes through the middle of the hill face and a stream runs from the left flank of the area. The vegetation in the area is scarce.



Plate 2: Western View of Bawngkawn Landslide



Plate 1: Eastern View of Bawngkawn Landslide

The dimensions of the slides are: length - 250 m, height - 150 m and width - 25 m. The material involved in the sliding is debris and small and large blocks of rocks. The supply of the material is from four to five metres thick overburden and 150 m hill face composed of highly weathered and jointed sandstones intercalated with thin layers of shales and siltstone alternation.

Geology of the Area

The dominant rock types exposed in the area are sandstones, shales and siltstone-shale alternations. These form the sandstone-shale Unit of Middle Bhuban formation (Tiwari and Kumar, 1995). The sandstones are thickly bedded, grey to brown coloured, medium to coarse grained, relatively

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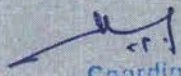
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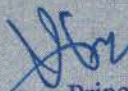
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SERKAWN CONCERT : MIZO HNAMZIA LEH NUNPHUNG PHOLANGTU

BY H.LALRAMMUANI *

Mizo Literature chanchin-a hun pawimawh tak mai chu kum 1920 leh 1950 inkar hi a ni. R.L.Thanmawia chuan chuan he hun hi "Hun Rangkachak" (Golden Period) an vuah hial a.¹ Hemi hun chhung hian Mizoram nasa takin in lumlet a, ram inrelbawlna, khawtlang nun, leh ei leh bar sawn dan kawngah nasa takin thil a inher danglam a ni. Hemi hun chhungah hian Mizo Literature-in hma a sawn nasa hle. Mizo Novel a lo piang a, Lemchan a thang chho mek a, hla pawh chi hrang kan hmehriat chho zel baw. Kristian sakhua avangin Mizo hla hluite han tawmim deuh mah se, mihringin a lunglen zawng leh vei zawng zalen taka a puan chhuah theihna tur, Kohhran ngaih-mawh loh zawnga hla thar (hla lenglawng) inlar chhuahna chu he hun rangkachak huam chhunga kum 1932 - 1946 a Serkawn concert hi a ni.

* Assistant Professor, Department of Mizo, Pachhunga University College

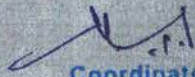
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Published By

TM Offset Printers

Hlamawi Kùtpui : Serkawn Concert (Contemporary Approach)

ISBN: 978-81-933676-2-9

2017

Price : ₹ 300

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Printed at:

KL Offset Printers
C-40, MG Road, Aizawl - 796005,
Mizoram, India
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Email: kloffsetprinters@gmail.com

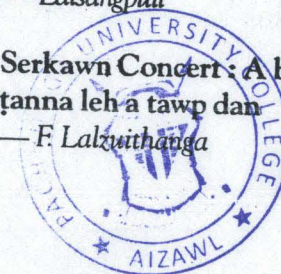

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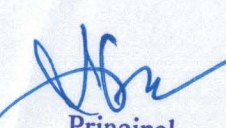
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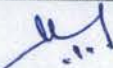
HLA MAWI KUTPUI

SERKAWN CONCERT

A LITERARY APPROACH

Edited by

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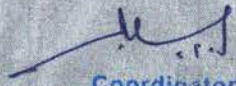
LAHROTLUANGA *

Mizo ten kan hun tawn zingah kum 1920 atanga 1965 inkara hi a inlumlet nasa hle a, Mizo literatureah hian a pawimawhna hrang hrang sawi dawn ila sawi tur tam a awm thei awm e. Kum 1919 harhna a vangin Mizo rilrem a tak sak nuam kan tih leh kan tuipui Lengkhawm zai te alo a, Thawnthu (novel) lamah Biakliana (1918-1941) chuan a novel hmasa ber 'Hawilopari' chu a ziaak a. Tin Kaphleia (1910-1941) pawhin Mizo essay hmasa ber 'Thlirtu' a ziaak bawk a. Midang a tam tak pawh hetih hunlai hian a rawn chhuak bawk. a hmawmna te, poetry leh literature kawng dang dangah a hmawmna leh thil thar tam tak hmuh tur a awm bawk. 1920 atanga 1965 inkar chung hian Zofaten kawng tin rengah a kan kutna hun, thu leh hla lamah phei chuan rahbi thar a kawng tam tak a awm avangin hun pawimawh tak, "Hun a Golden period tia vuah hial tham a tling" (168)

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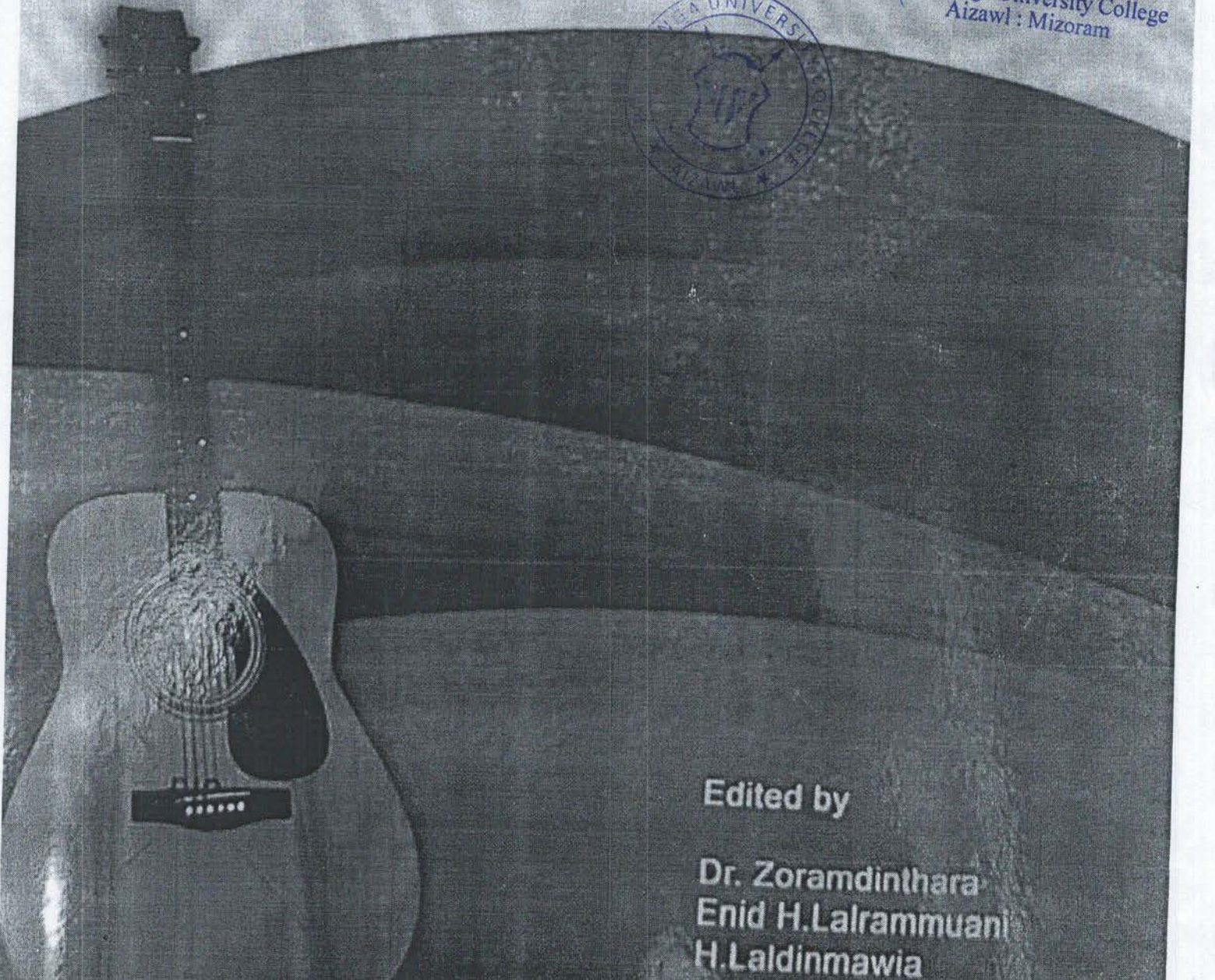
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SERKAWN CONCERT: POETIC GENRE HRANG HRANG PARVULNA

REMLALTHLAMUANPUA*

Khawvel hnam hrang hrangte hian hmasang ata tawh hnam zai bik an nei theuh a, J.Malsawma chuan Mizote chanchin chhui theih anih chin hla ber vel atangin Mizote zingah pawh hla hi lo piangin a ngai a (RL Thanmawia, 24). Mizo hnahtlakten hla an neih tan hun tak sawi a har a, eng hunah chiaah nge hla an neih tan a, engte nge an hla hmasa chu tih chu a pawimawh ber a ni lo va; amaherawhchu, mihring nunah hian hla hi a serh zinga mei ang tlat a ni thung. Nuin fa a awihna aw hi hlaah a chang a, lawmte nui ri pawh hlaah a chang a, lusunte leh lungngai tap thawm pawh hlaah a chang a, pasalthate ropuina leh inhnial thawm thlengin hlaah a chang thin.

Hla lo pianchhuah chhan a hrang theuh angin Mizo hlu atang rengin hla chi hrang hrang kan hmu a, Mizo hla hluite kha hla chi hrang hrang Dar hla, Naupang hla, Hlado leh Bawh hla,


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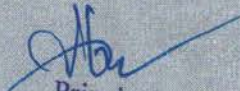
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SERKAWN CONCERT : POETIC TECHNIQUES-A A HAUSAKNA

H.LALDINMAWIA*

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Khawvel-in hun tam tak a her liam pui tawh zingah hian pawimawh leh danglam bik a awm thin a, mihring tam tak piang tawh zingah pawh hian chhuan thar zel te thinlunga damrei bik an awm thin bawk. Chutiang chiah chuan Mizo thu leh hla (literature) khawvelah ngei pawh hian hun chhinchhiah tlak bik leh pawimawh bik chu a lo awm nanging mai. Mizo hla than chhoh dan zirna mualah ngat phei chuan kum 1920 atanga 1950 inkar, kum 30 chhung hi 'hun rangkachak' (golden period) tiin lo chhâl ta pawh ni ila a mawh lovang.

Kristian sakhaw tharin a hrin chhuah Zosap missionary te chahnemngaihna hla phuah, ulh leh un tak tak mai chu kalsanin, Mizo irâwm chhuak Pathian fakna hla dak leh danglam, mawi leh mam tak tak mai te chu kum 1920 atanga 1940 inkarah khan a rawn piang chhuak ta chur chur mai a. Kum 1919-a Mizorama

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Serkawn Con

thlarau lam
chu rawn su
hmun' tih hla
na bul a raw
RL Kamla (1949) leh mi
par parhtir ti
daih rei leh d

Hetik
chuan bu a ra
leh zirchian ti
chu kum 1932
a rawn pianh
buatsaih chhar
lar' (Thanmaw

Hawi la
thuhmunah, in
Mizoram hmar
lenglawng leh ra
chhuakte hi a hu
hunah ngaihsan
chuan Mizote thi
chuan kum 1920
chuan hun pawir
ture-a hla kumhl
dawn a ni. (Siamk

'English Hl
Geofrey Chaucer-
ziah khawmna 'can
sulsutu pawimawl
'Serkawn concert' hl
a hmahruaitu an ni

Dr. LALZAMA



MIZO LANGUAGE AND LITERATURE

EMERGENCE AND DEVELOPMENT

[Contribution of Christian Missionaries from 1897 - 1947]

ABBREVIATIONS USED

A.B.M.U.	= American Baptist Missionary Union.
B.M.S.	= Baptist Missionary Society
I.S.S.U.	= India Sunday School Union
K.T.P.	= Kristian Thalai Pawl
L.S.A.	= Lushai Students' Association
M.S.S.U.	= Mizo Sunday School Union
M.A.L.	= Mizo Academy of Letters
W.C.M.F.M.	= Welsh Calvinistic Methodist Foreign Mission
S.P.C.K.	= Society for Promoting Christian Knowledge
Y.M.C.A.	= Young Men's Christian Association


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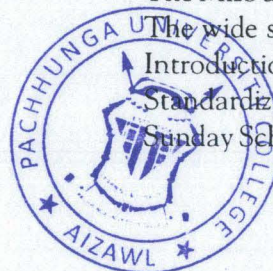
The coming of Christian missionaries to India
 Missionaries in Mizoram
 Pioneer missionaries
 The coming of Welsh missionaries
 Establishment of Baptist Mission in Mizoram
 Purpose of propagating Christianity in Mizoram
 Establishment of school
 Government school
 Mission school

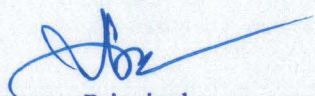
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 Sunday School




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**Mizo Language and Literature : Emergence and Development
[Contribution of Christian Missionaries From 1897 - 1947]**

ISBN: 978-81-935083-2-9
2017@KL Offset Printers
Price : 300

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Published and Printed at:

KL Offset Printers
C-40, MG Road, Aizawl - 796005,
Mizoram, India
Mobile : 919862725123
Phone : (0389)-2311260
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PREFACE

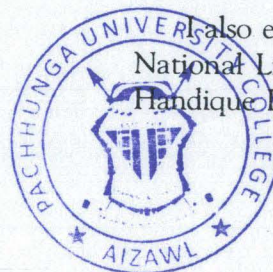
Mizo is a modern language spoken by more than ten lakhs people. Since it has been recognized as a standard language, it has become extremely necessary to study scientifically the growth and development of the language and literature with its various aspects and find out various steps to be undertaken by the present generation of the Mizo for development of their language and literature.

With a view to fulfilling the long standing desideratum of a thorough investigation and research concerning the growth and development of the Mizo language and literature the present work under the name and style 'Growth and Development of Mizo Language and Literature from 1897 to 1947 with special reference to the contribution made by the Christian Missionaries' has been undertaken under the guidance and supervision of Dr. B.Sarma, Department of Modern Indian Languages, Gauhati University, Gauhati. It would have been absolutely impossible to complete this work without his benevolent help. I, therefore, express my sincere and heartfelt gratitude to him.

I am also thankful to the Government of Mizoram for granting me a Research Fellowship for carrying out the work.

My thanks are also due to the church leaders and other local elders who gave me very useful informations necessary for this work.

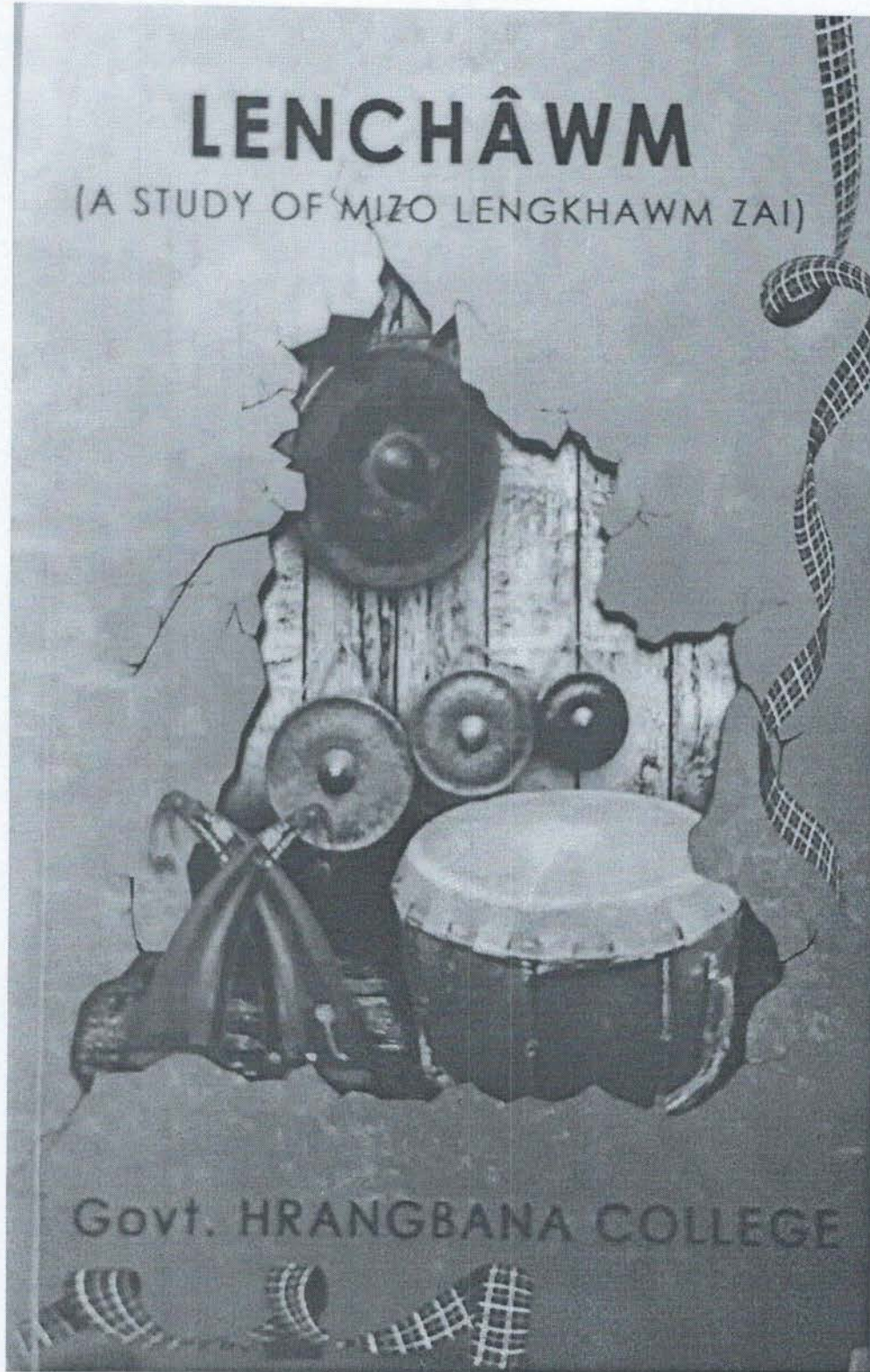
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LENCHÂWM

(A STUDY OF MIZO LENGKHAWM ZAI)



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LENCHÄWM

Serampore Senate pakhat, Mizorama, a lo kal tuma a thusawi, "Mizo kohhran hi a din chhung chu zai hi a reh tawh lo vang a; Mizo kristiante an zai chhung chuan kohhran hi a nung reng dawn a ni" (KHB, iv) a tih hian funkhawm kim viau awm e. Kan la zai zel ang a. kan la hlim zel ang; chung hunah chuan Mizo lengkhawm zaita hi hmun pawimawh ber luahtu, kan hlimpui ber a nih zel a rinawin. Heng hla tha tak tak, kan hnam nun nena inhmeh tak hla kan lo neih avang hian Mizo kristiante hian Pathian hnenah lawmthu sawi kan ba nasa hle a ni.

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Lengkhawm Zaiin Mizo Literature a Tihhausak Dan

(The Contribution of Lengkhawm Zai for the Enrichment of Mizo Literature)

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Department of Mizo

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Classical literature ngaihsan hun khawvelah khan ziaik mi zawng zawngin dan leh hrai zul zuia lemchan ziah kha a tur rengah an ngai a; thu leh hla tha parvul hun tia an sawi, Greek leh Latin literature 'Classsical literature' tia an sawi thin hun lai hian eng thu pawh ziaik se chu dan chuan a phuar tlat thin; chu chuan ziaik mite suang tuahna khawvel zalen taka vak vel chu a dang chep tlat thin; amaherawh chu, chu chu khawvel literature-a bung tharrawn kai tirtu Literary movement hmanraw pawimawh tak a ni ta zawk a ni. Chung dan leh hrai hnuaia thu ziah chu a hah tlat viau ni ngei tur a ni, kum zabi 16 a lo hier chhuah chuan Christopher Marlow-a chuan classical literature dan leh dun zawng zawng chu hnawi vek chuang si lovin lemchan thar a chawi lar tan a; Marlow-a tha hnem auraw chu William Shakespeare-a chuanrawn tichakin wawiin thlenga ziaikmite leh chhiartute ngainat Romantic literature chu a lo piang ta a ni. Aristotle-an, "Lemchan ruangam hi tragedy thlarau a ni e" (S.P Sen Gupta:95) tia sawi thin chu engah mah ngai lovin, Shakespeare-a chuan "Character hi a pawimawh ber a, thawnthu ruangam chu a dawttu mai chauh a ni e" a ti then mai. Lemchan changtu atana classic lemchan ziaiktuten vantlang chung lam kher

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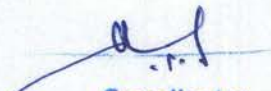
RE-READING OF MIZO LITERATURE

(with special reference to under graduate course)

A compilation of Seminar Paper



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REVISITING FRANCIS BACON'S ESSAY 'OF STUDIES'

Dr. Zoramdinthara
Asst Professor
Dept of Mizo
Pachhunga University College

1. The author:

Francis Bacon 'the father of English essay' was born on January 22, 1561 in London. (Kumar 99). His father was a noted lawyer and statesman. Due to bad health, Bacon received education at home only, in the starting years of his life. He received tuitions from John Walsall who was a graduate of Oxford with a strong bending towards Puritanism. On April 5, 1573, Bacon got admission in Trinity College, Cambridge at the age of 12. He spent there for three years with his older brother, Anthony. There he was taught mainly in Latin followed by the medieval curriculum. He went on to get education from the University of Poitiers. At the Cambridge, he met Queen Elizabeth, who was influenced by his exceptionally smart intellect called him the young Lord Keeper. Bacon's studies guarded him to the belief that the methods and results of science as practiced then were completely wrong. He dislikes Aristotelian philosophy and took the Aristotelian philosophy as unprofitable, argumentative and incorrect in its objective. He and his brother, Anthony entered at Gray's Inn to study law on 27th June, 1576. After some months, Bacon went Paris for acquire further educative experience.

Bacon was also keenly desirous of working his way into the affection of Queen Elizabeth. But the recognition that he expected from the Queen did not come his way, hard though he fought for it. (Mudra 18). In the beginning he attached himself to Lord Burghley who was related to him and was then acting as the Lord Treasurer. At this juncture, Bacon started becoming thick with Lord Essex one of the favourites of the Queen and the association between them stronger and from Essex he received the gift of an estate at

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Twickenham. Unfortunately, when in 1599 Essex was impeached for his failure to suppress a rebellion in Ireland and in disgrace of the Queen, he changed his sides and appeared as the prosecutor against the unfortunate friend, who was executed. Nevertheless, he could not receive any tangible reward from the Queen till her death in 1603. Fortunately after coronation of James I, he spent all his art in ingratiating himself with the king. Then he was knighted in 1603 and became Solicitor General in 1607, Attorney General in 1613, Lord Keeper in 1617 and Lord Chancellor in 1618 (Abbot 111). Apart from these, he received the title of Baron Verulam in 1618 and of Vicount St. Albans in 1621. But his rapid rise soon followed by an equal downfall. He was charged with taking bribes in his official capacity and he himself admitted the validity of these charges. On 3rd May 1621, he was found guilty and he was permanently divested of all his offices and was force to leave London and begin life at his estate of Gorhambury. One day, he conducted experiment of some scientific method by using snow for preserving meat. Bacon went to poor lady's home at the Highgate hill. He brought fowl from there after asking woman to clean the same. Then he stuffed fowl with lots of snow but developed dangerous disease, pneumonia. On April 9 1629, Francis Bacon died at Arundel mansion at Highgate outside London due to severe pneumonia.

2. The works of Bacon:

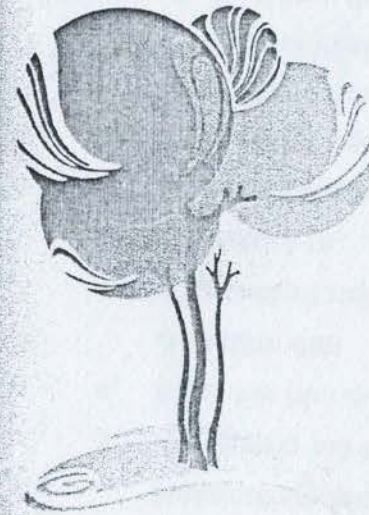
Bacon was a versatile thinker and writer both in Latin and English. Of course, he is the first English writer to introduce a new literary form called Essay. But he is rather remembering today by dint of his English works while his Latin works were fallen into oblivion. His English works were as follows- The Advancement of learning 1605, The new Atlantis 1604, Novum Organum 1620, the History of Henry VII 1621 and Instauratio Magna. The year 1597 when Bacon published his ten essays marks the beginning of essay writing in English literature. (Kumar 101) The first edition of his essays contain ten essays whose titles are given under Of studies, of Discourse, Of Ceremonies and respect, of Followers and Friends,

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DR. ZORAMDINTHARA



Dr. Zoramdinthara hian Mizoram University, atangin Ph.D a zo a, tonah hian Pachhunga University College (Constituent College of Mizoram University), Mizo Department-ah Assistant Professor hna a chelli mek. A research paper te hi lehkhahu leh chanchinbu hrang hrangah a chhuah tawh a. Lehkhahu pahnuh - *Emergence and Development of Mizo Fiction* (2013) leh H.L.aldinmawh nena an edit *Zofawng : Nihphung, Dinimun leh Hmawhlir* (2013) tih te a chhuah tawh bawk. NSS (National Service Scheme)-ah Programme Officer min, a hnathawh that avangin kum 2015 khan *State NSS Award for Programme Officer* chu Mizoram sorkar linen atangin a dawng a, kum 2016 khan *Indira Gandhi NSS Award for Programme Officer 2015-2016* chu India President linen atangin a dawng leh bawk a ni.



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THINGSIRI PAR (Critical Writings on Mizo Literature)
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Email: sbcbook@rediffmail.com

ISBN: 978-81-287-0031-6

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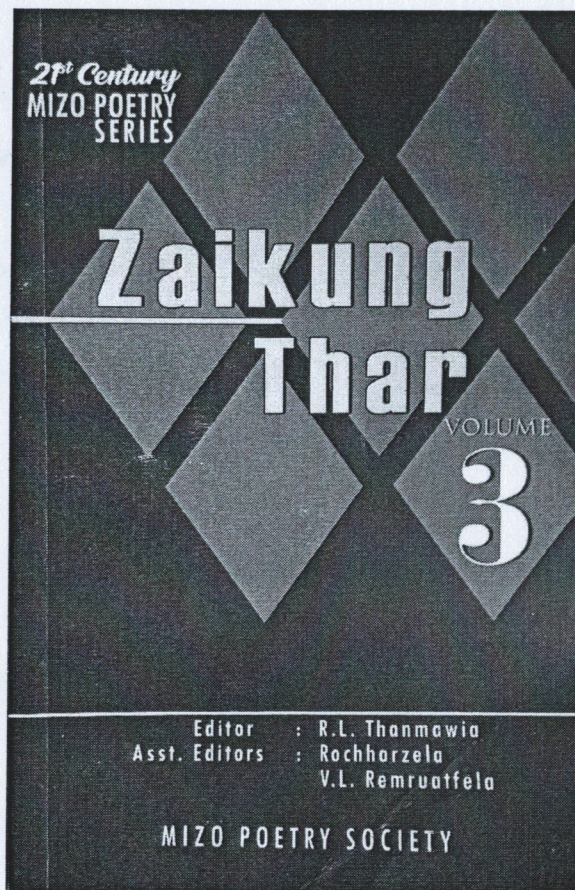
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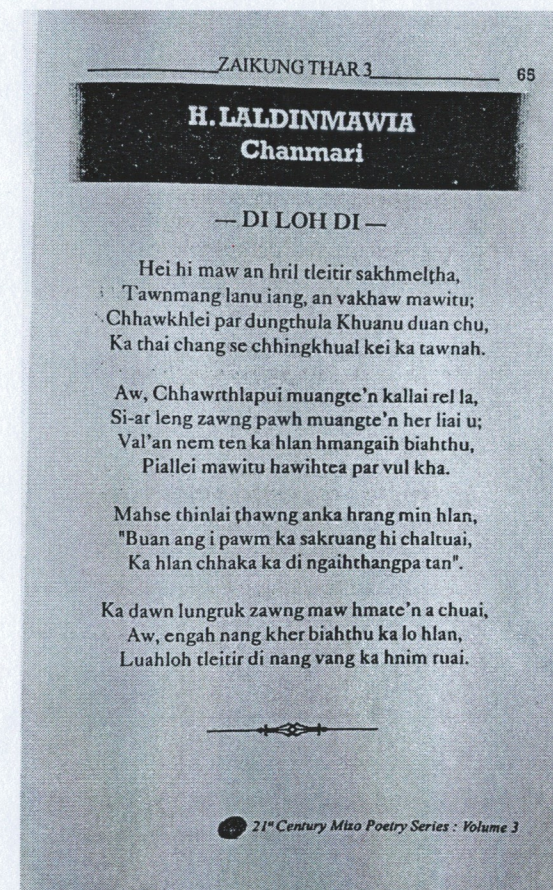
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KA VEIZAWNGTE
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**(Essays on contemporary issues in Lalram:
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**THE ISSUE OF REGIONAL
AUTONOMY IN MIZORAM
(1947-1993)**

L.H. CHIUANAWMA

The Issue of Regional Autonomy in Mizoram (1947-1993)

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