Vol 6 Issue 1 Oct 2016

ISSN No : 2249-894X

Monthly Multidisciplinary Research Journal

Review Of Research Journal

Welcome to Review Of Research

RNI MAHMUL/2011/38595 **ISSN No.2249-894X**

Review Of Research Journal is a multidisciplinary research journal, published monthly in English, Hindi & Marathi Language. All research papers submitted to the journal will be double - blind peer reviewed referred by members of the editorial Board readers will include investigator in universities, research institutes government and industry with research interest in the general subjects.

Regional Editor

Advisory Board

More.....

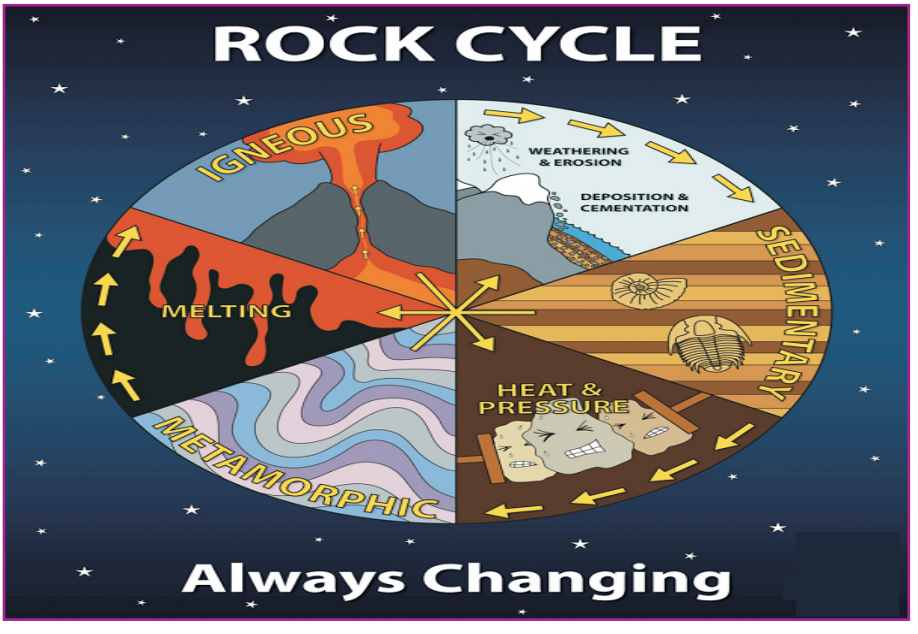
Address:-Ashok Yakkaldevi 258/34, Raviwar Peth, Solapur - 413 005 Maharashtra, India
Cell : 9595 359 435, Ph No: 02172372010 Email: ayisrj@yahoo.in Website: www.ror.isrj.org

ISSN: 2249-894X Impact Factor :3.8014(UIF) Volume - 6 | Issue - 1 | October - 2016

Review Of Research

IMPACT OF CLIMATE CHANGE ON ROCK CYCLE

Dr. Sakdeo Babita Marutirao
Associate Professor, Agricultural Development Trust,
Shardabai Pawar Mahila Mahavidyalaya,
Shardanagar, Malegaon Bk. Baramati, Pune.



ABSTRACT

The geologic cycle is a collective term used to describe the complex interactions between the component sub-cycles of tectonic, hydrologic, rock, and the biological cycling of elements known as the biogeochemical cycle. These various subcycles influence each other and may produce natural hazards and processes important to environmental geology such as landslides, earthquakes, volcanic activity, flooding, groundwater flow, and weather. The rock cycle is influenced by all the other geologic subcycles.

KEYWORDS: *The geologic cycle, hydrologic, rock, tectonic.*

INTRODUCTION

Throughout its history which is about five billion years old, the materials of the earth have more or less been continuously created, maintained and destroyed by physical, chemical and biological processes, except during the very early period of our planet. The processes that produced many earth materials necessary for human survival have recurred periodically. Collectively, all the processes responsible for the formation of new earth materials are referred to as the geologic cycle. It is a group of sub-cycles, viz. hydrologic cycle, the tectonic cycle, the rock cycle and the geochemical cycle.

Theories of geological evolution

Introduction

Right from the beginning of this planet, earth has witnessed several tectonic movements by one way or the other. It is now well established fact that the continents and oceans today were not at the same positions in the past. Scientists also believe that there is isostatic balance between continental masses and ocean floors or depressions. Thus, the roots of the mountains are much deeper than the roots of sea floors because mountains are highland portions of the crust and require more support for balance. Wegener's idea about the positions of continents and oceans at the beginning of this century created lot of turbulence in geology and geography.

Wegener's Theory of Continental Drift

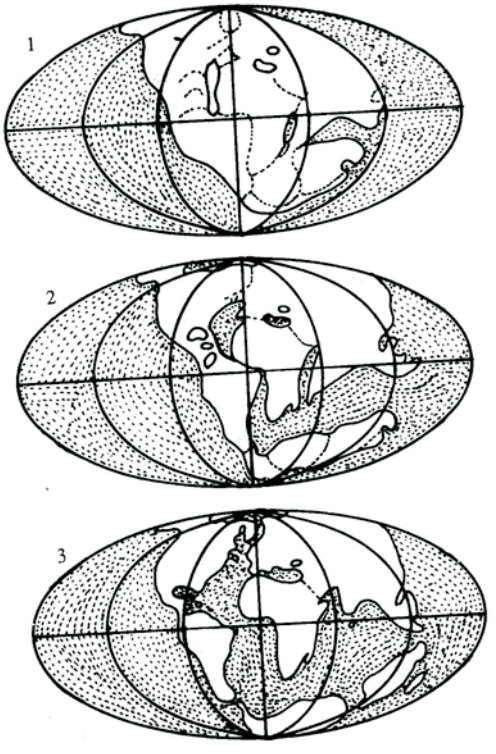
Alfred Wegener, was a German scientist. He put theory of continental drift in 1912. He provided supporting proofs (evidences) to claim his arguments and thus generated lot of inertia for research.

Principles of Theory

1. The positions of continents and ocean basins are not static but gradually witness changes through time.
2. Today's seven continents are the pieces of one megacontinent of the geological past.
3. The base of continents (SIAL) is lighter than base of ocean floors (SIMA), sial is floating on sima, a denser element.

Explanation

According to Wegener there was only one megacontinent during geological past (about 200 million years ago) as shown in the diagram. It was triangular in shape. Wegener called it as 'Pangea'.



(1) Late Palaeozoic (2) Late Tertairy (3) Pleistocene
C : Evolution of the continents according to Wegener.

During cretaceous times, (about 136 million years ago) the Pangea broken into two pieces known as Laurentia and Gondwana, Laurentia lied on the north and Gondwana lied on the south. Breaking of the Pangea into Laurentia and Gondvana created a depression or sea basin. Wegener called the sea as "Tethys Sea ".

According to Wegener the two pieces (Laurentia and Gondwana) experienced drifts towards equatorial plane and in the Western margins. As a result, these two landmasses further broken into small pieces. As continental landmasses are light weight (silicon and aluminium) than ocean floors (silica and magnesium) the continental drift carried the continental land massses away from each other. Laurentia break up into North America and Eurasia while Gondwana break up into South America, Africa, Antarctica, Asia and Australia. Sial landmasses experienced two movements - one towards west and another towards equator.

Thus, North and South America were carried towards west while Gondawana piece further broken into small pieces to form Australia. Africa and Peninsular India.

Thus, the present distribution of continents and oceans in the world came into existence during pliestocene period.

To support the theory, Wegener presented following proofs.

1. Geographical evidences.
2. Geological evidences.
3. Climatological evidences.
4. Palaentological evidences.
5. Biological evidences.
6. Geophysical evidences.

1. Geographical Evidences: East and West coasts of Atlantic ocean. reflect similarities. Gulf of Guinae (West coastal part of Africa) and Brazilian coast of South America show Jigsaw fit. East coasts of North and South America and West Coast of Europe and Africa show general fittness. On the same principle West coasts of India and Ethiopia and East coast of Africa show general fitness. Similarly northern tip of Australia can be well fitted into the Bay of Bengal. These matchings of coastlines mentioned above made Wegener to believe that all these continents of present day had once been part of a great megacontinent to which he called Pangea.

D : Jig-Saw fit of continents

Then as the earth revolved the landmass eddied about and at least broken into pieces of present day continents. The American continents moved westward.As they moved westward their western edges crumpled to form folded Rockies and Andies mountain chains. The barge like shape intensifies the possibility of drift over the earth.

2. Geological Evidences : Wegener also pointed out geological similarities on the opposite sides of the Atlantic ocean. The rocks found on east coasts of Americas and the West coasts of Europe and Africa were similar in their origin, type and character. Caledonian and Hercynian mountain patterns of Europe show similarity of patterns in Appalachian, Red mountains of North America (along east coast). Relief of Africa and Brazil also show similarity.

3. Evidence of Geodesy: The distance between some landmasses shows changes. For example, distance between America and Greenland is increasing gradually. Greenland is drifting away from American continent at the rate of 2.2 mt per year. The distance between Greenland and Britain increased by 32 mt in 24 years. The

distance between Vancuver and Ottawa is decreased by 6 mt. in the period of 9 years. These evidences of geodesy express that the drifting of continents is still continuous.

4. Palaeontological Evidence: Fossils of East and West coasts of Atlantic Ocean are found similar. The remnants of plants and animals thus, show similarity of their presence on the same united land in the past.

5. Biological Evidence: Flemingo birds near the Scandinavian islands show interesting evidence to support the Wegener's idea. These birds after every 15 to 20 years, (when their population reaches at climax) migrate towards west and disappear due to fall in the sea because now there is no land mass as it was there in the past. The migratory habit of the past seems to be continuous with respect to this migration; Ancestors of these birds might be travelling towards west,

6. Palaeo - Climatological Evidence : Part of South Africa still show the glimpses of the glacial work in the tropics which is not possible today. Glacial erosion and depositional features are found in Australia and Rajputana desert of India. These remains of the glacial stamps suggest that both were parts of so called Gondwana land.

OBJECTIONS

1)Wegener's theory is objected on the ground of inability to explain the force required for the drift.
2)The drifting of continents would have required tremendous force and existence of such tremendous power seems to be impossible because such power might have stopped the revolution of the earth around the sun.
3)According to radioactive theory of Jolly, Wegener mistaken the horizontal movements of the continents. These movements might be c vertical than horizontal.
4)Radioactive sima layer might have broken the continents into pieces because of fractional heat energy.
5)Some scientists pointed out the critics against Jig-sawfit Eelement in Wegener's theory. According to critics the fitness of some continents is to some extent only.
6)Some scientists question about the time and direction of the drift.
7)Geologist object mainly that how the continents have drifted.

All these evidences clearly reflect the reality of isostatic principle.

Erosion or denudation is continuous process all around the crust of the earth. Materials are derived from some places like mountains and plateaus due to gravity of slope. Erosive power of agents (rivers, glaciers, winds etc.) carry it to some another localities such as plains and sea beds. As a result of these denudational processes the areas from where the material is drawn becomes lighter in weight and areas where the material is deposited gets heavier so that the balance of the crust gets disturbed. Due to isostatic tendency of the earth's crust the sinking of one part of the crust gets adjusted with rise of lighter part of the crust and the balance is again restored. This rising in one part caused due to sinking in another part of the crust continues until the correct adjustment has been made.

CONCLUSIONS=

After a century of specialization, Earth system science rapidly emerges as a unifying concept in the geosciences. Gravitational pull has differentiated the Earth into layers (or spheres). In each layer masses convect but layer bounda- ries are leaky such that masses and energy are being transferred across them. In this way, the Earth becomes a complex system of interacting components. Prediction in geosciences, such as earthquakes, volcanic eruptions or occurrence of resources in the deep subsurface, is facilitated by tackling the problem in a broad context that includes all relevant components of the Earth system. Earth system science is a very advantageous platform for teaching because of the many unifying principles that hold it together, the vivid images and the relatively low level of required mathematics.

REFERENCES=

1.Allen, P.A., 2008. From landscapes into geological history. Nature, 451, 274-276.
2.Asrar, G., Kaye, J.A. and Morel, P., 2001 NASA research strategy for earth system science: climate component. Bulletin

3.American Meteorological Society, 82, 1309-1329.
4.Bak, P., Tang, C. and Wiesenfeld, K., 1987 Self-organized criticality: An explanation of 1/f noise. Physical Review Letters, 59, 381-384.
5.Bak, P., 1996 How Nature Works. New York, Springer, 212 pp
6.Berger, W.H., 2008 Sea level in the Late Quaternary: patterns of variation and implications. International Journal of Earth Sciences, 97, 1143-1150.
7.Broecker, W.S. and Peng, T.H., 1982 Tracers in the Sea. New York, Eldigio Press, 690 pp.
8.Suess, E., 1888-1909 Das Antlitz der Erde, v. 1-3. Vienna, Hölder.

Dr. Sakdeo Babita Marutirao
Associate Professor, Agricultural Development Trust, Shardabai Pawar Mahila Mahavidyalaya, Shardanagar, Malegaon Bk. Baramati, Pune.

Publish Research Article
International Level Multidisciplinary Research Journal
For All Subjects

Dear Sir/Mam,

We invite unpublished Research Paper,Summary of Research Project,Theses,Books and Books Review for publication,you will be pleased to know that our journals are

Associated and Indexed,India

- Directory Of Research Journal Indexing
- International Scientific Journal Consortium Scientific
- OPEN J-GATE

Associated and Indexed,USA

- DOAJ
- EBSCO
- Crossref DOI
- Index Copernicus
- Publication Index
- Academic Journal Database
- Contemporary Research Index
- Academic Paper Databse
- Digital Journals Database
- Current Index to Scholarly Journals
- Elite Scientific Journal Archive
- Directory Of Academic Resources
- Scholar Journal Index
- Recent Science Index
- Scientific Resources Database

Review Of Research Journal
258/34 Raviwar Peth Solapur-
413005,Maharashtra
Contact-9595359435
E-Mail-ayisrj@yahoo.in/ayisrj2011@gmail.com