

EARTHQUAKE HISTORY OF INDIA IN MEDIEVAL TIMES

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Several parts of the Indian subcontinent, especially the Himalayas, are well known to be seismic. But data on earthquake prior to the colonial period are scarce. Needless to say that such data is essential for reliable seismic hazard estimation. Recent earthquakes of Uttarkashi, Killari, Jabalpur and Chamoli underline the need for collecting information about earthquakes in the historic past. The present work is a significant effort in this direction. The authors have carried out an intensive search of the primary sources of history for sifting the relevant information. Thirtyeight earthquake events, which were not so far properly catalogued, have been identified with their date and place of occurrence. It is hoped that the outcome of this research will improve the present database on Indian earthquakes. This publication focusses on the medieval period, namely, 1200 AD to 1800 AD, even though a few earthquakes of the earlier era are also listed.

Keywords: Assam, Burunji, Earthquakes, Kashmir, Medieval period, Persian literature, *Rājatarāṅgini*

INTRODUCTION

Information on magnitude and frequency of earthquakes is essential for proper assessment of the seismicity of a region. For this purpose a comprehensive and accurate data base of past earthquakes is required. Without this, correct determination of return periods are difficult. Besides being advantageous in the siting of large scale engineering projects, a good earthquake data base is important for understanding tectonic geology of a region.

In India present hazard estimates are based on limited historical data as the information on earthquake prior to 1800 AD is not comprehensively catalogued. There have been attempts in this direction and some earlier notable publications are by Oldham (1883), Baird Smith (1843, 1844), Milne (1911) and De Ballore (1934). However, in all such cases information on the earthquakes of historic past is rather sketchy. The present catalogues,

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e.g. the one published by the Indian Society of Earthquake Technology (Bapat et al., 1983) lists only about 40 earthquakes in Indian subcontinent, including its neighbouring countries, prior to 1800 AD in a period of four millenia.

There may be several reasons for this scarce information on earthquakes in India. The most important one is that the historians have mainly focussed their attention on political and social history of India. Earthquakes, if they were not devastating, rarely find a mention. On the other hand there has been no serious attempt to scan primary sources of history for this purpose. The task becomes difficult because most of the sources of history are not in modern and current languages and scripts.

The present work mainly concentrates on the medieval period, namely 1200 AD to 1800 AD. Primary sources of history for this period are available in the form of writings of court historians, travelogues, epigraphs and other documents. A sizeable number of these sources is in the Persian language. There are also writings in Sanskrit, Arabic, Turkish and regional languages of India. Many of these manuscripts are not yet published.

The present investigators have carried out an intensive search of records in libraries, archives, archaeological memoirs, records of geological investigations and other sources of history. Assistance has been sought from historians, archaeologists, geologists, indologists and others. The objective of the study was to compile dated information on earthquakes of India prior to 1800 AD and to estimate the mentioned effect of the shock in terms of the MMI intensity scale.

The search has been rewarding in respect of Kashmir and Assam. Information about twelve earthquakes in Kashmir and eight in Assam has been obtained. Besides this eighteen more are added to the list of uncatalogued earthquakes from other parts of India. It may be noted here that the geographical area considered is the India including neighbouring countries. More than two hundred references have been scanned. Several of these are unpublished manuscripts available only in special libraries.

EARTHQUAKES IN KASHMIR

There are several sources of the history of Kashmir. The most important one is the Sanskrit work *Rājatarangini*, (river/stream of kings) which is generally known as the work of Kalhana Pandit (12th century AD). Kalhana authored the first part only covering the period from remote past to 1148AD. According to Dutt (1879) the next part entitled *Rājāvali* was written by Jonaraja, and brings the history down to 1412 AD and this again has been continued under the name of the *Jainrājatarangini* by his pupil Śrīvāra to 1477 AD. The fourth and last part, the *Rājavaliptaka* brings down the history of the country to the time of its conquest by Akbar, and was written by Prajya Bhatt and Śuka at the time of that em-

peror. Sufi (1974) is of the view that Śuka's work is mistaken for the joint work of Prajyabhātta and Śuka by some historians. It may be noted that all the above referred works, both collectively and individually are generally known as *Rājatarāṅgini* and sometimes part specified by particular author's name. Besides *Rājatarāṅgini*, there are several Persian language sources, some of which are regional histories of Kashmir. The *Tarikh-e-Hasan* by Pir Hasan Shah (19th Century AD) available in manuscript form at Aligarh Muslim University, deserves special mention. This contains a full chapter on natural calamities, including earthquakes.

The earthquakes which find mention in the various sources of history of Kashmir are presented below in chronological order:

Wular lake earthquake, 1250 BC (Estimated)

Pir Hasan Shah, the author of 'Tarikh-E-Hasan' records thirteen earthquakes of Kashmir while dealing with the calamities of Kashmir from earliest times to 15th of Shaban, 1320 H. (30th May, 1885AD). According to him the first calamity of an earthquake occurred during the reign of Sundersen of Pandu dynasty, in 1250 BC. (Dating is on the basis of historicity of *Mahābhārata*) Pir Hasan Shah states that:

"Once upon a time, the town of Sindmat Nagar was situated in place of Ular lake. The inhabitants of this place were punished on account of their misdeeds in the form of an earthquake. During the period of Sundersen a devastating earthquake struck at night. The entire town was reduced to shambles. Cracks appeared on the surface of earth and from there water gushed out and the entire town was deluged. Thus in the aforesaid manner there appeared *Ular Nag* (Wular Lake)".

(*Tarikh-e-Hasan*, f. 169b)¹

He further informs that due to an earthquake the underground water of the lake burst out from the surface to inundate the area from Sindmatnagar to Bijbahera including the mount Khadaniyar, which can be presently related with a village of the same name (34°11' N, 74°22' E approx.).

One of the modern authorities in the history of Kashmir, G.D.M. Sufi (1974) in his 'Kashmir-Being a history of Kashmir' states that:

'In the reign of Sundarsena, twenty-second in the line (Pandu Dynasty), a great earthquake clove open the earth in the middle of the capital Samdhimat Nagar, and the whole city was submergd along with its king and inhabitants. The site of the city is now occupied by the Volur (Wular) lake.' Sufi further informs that at that time Lava, Chief of Laulaba (modern Lolab) on the north east side of Kashmir was the elected king of the region.

The name of the Wular lake in historic past was Mahapadmasana and according to the legend the Naga Mahapadma resides in the lake and he converted the town Chandrapur into a lake to make it his abode.

The Wular lake in normal times covers an area of about 78 sq. miles. If the historical tradition is to be believed the MM intensity of this earthquake should have been around XII.

Blockade of the river Jhelum due to an earthquake, 883AD

(i) *Tarikh-e-Hasan* by Pir Hasan Shah mentions:

“The second calamity of a nocturnal earthquake occurred during the reign of Raja Ovantiverma in Vikram Sambat 940 (883 AD). Boulders from the mountainous ridge of Khadahneyar on Baramula side rolled into the bed of the river Behat and consequently the flow of the river was blocked. The ground level near Bijbehra was inundated and the entire adjoining villages and cultivable land, were destroyed. Then by the efforts of the intelligent, Suyya, stone conglomerates of the mountain were removed from the river bed and the water was set free. The ground level emerged as previous”.

(*Tarikh-e-Hasan, ff. 1690, 170a*)²

(ii) Kalhana in *Rajatarangini* narrates the skills of an able engineer Suyya in clearing the blockage of the Jhelum. He says:

“As he (Suyya) endeared himself to the virtuous by (keeping the) observances in regard to fasts, bathings and the like, and showed a brilliant intellect, men of sense kept around him in assemblies.

“When these were complaining in their conversation of the flood calamity, he said : I have got the knowledge (for preventing it). but what can I do without means “When the king heard through his spies that he was saying these words persistently, as if he were deranged in mind, he was surprised. The king had him then brought up and questioned him about his saying. He calmly replied also in the royal presence: “I have got the knowledge,” etc.

“Thereupon the lord of the earth, though his courtiers declared him (Suyya) crazy, was anxious to test (that) knowledge, and placed his own treasures at his disposal.

“He took many pots (full) of money (dinnaras) from the treasury, and embarking on a boat, proceeded in haste to Madavrajya.

“After dropping there a pot (full) of money, at a village called Nandaka, which was submerged in the flood, he hurriedly turned back.

"Though the councillors said: "That (Suyya) is surely only a madman," the king, when he heard this account, became interested in watching the end of these (proceedings). "On reaching in Kramarajya the locally called Yaksadara, he threw with both hands money (dinnara) into the water".

"There, where the rocks which had rolled down from the mountains lining both river banks had compressed the Vitasta and made its waters turn backwards (in which), the famine-stricken villagers then searched for the money (dinnara), dragged out the rocks from the river, and (thus) cleared the (bed of the) Vitasta.

"After he had in this manner artfully drained off that water for two or three days, he had the Vitasta dammed up in one place by workmen.

"The whole river, which Nila produced, was blocked up by Suyya for seven days by the construction of a stone dam, a wonderful work."

"After having the river bed cleared at the bottom, and stone walls constructed to protect (it) against rocks which might roll down, he removed the dam.

"Then the (stream), flowing to the ocean, set out on its course in haste, as if eagerly longing for the sea after its detention.

"When the water left it the land was covered with mud and with wriggling fishes, and thus resembled the (night) sky, which, when free from clouds, displays black darkness and the stars.

"Wherever he knew inundation-breaches (to occur) during disastrous floods, there he constructed new beds for the Vitasta.

"The river, with its numerous great channels branching off from the original channel, appeared like a black female serpent, which has numerous hoods resting on one body".

(Stein, I, Trans. pp. 197-98)³

The modern town of Sopor (old Suyyapura) is named after this able engineer. Suyya and the memory of the king is also preserved in the place name of Avantipur (Vantipore).

It may be noted that the two narratives are corroborative, although Kalhana does not mention about an earthquake. Both the authors might have based their accounts on some folk tradition. The sequence of events - occurrence of an earthquake, rolling down of stones, blockade of river and measures for clearing the river are quite logical. The possibility of an earthquake cannot be ruled out. Since the main thrust of the narrative is about the rolling down of the rocks the event may be estimated as MM intensity V.

Tremors in Srinagar, 1123 AD

Kalhana was a contemporary of king Sussala who ruled Kashmir for a second reign during 1121 AD - 1126 AD. In the year 1123 AD when Srinagar was under a siege, Kalhana describes (Stein, 1989):

“Fiercely burned the Sun earthquakes occurred repeatedly; and there blew sudden storms of great violence which broke down trees and rocks”.

(*Rājatarānginī*, VIII, verse No. 1167, p. 92)⁴

An earthquake in Srinagar, 24th September, 1501 AD

The *Tarikh-e-Hasan* mentions about an earthquake which is not mentioned in the contemporary Sanskrit source, namely the *Rājatarānginī* by Suka. Pir Hasan Shah records:

“During the reign of Sultan Fath Shah on 12th of Asvach Pasi of 970 H. (September, 24th 1501 AD) a severe earthquake occurred in the previous night. A large number of creatures of God lost their lives and houses were razed to ground. The earth and sky remained in tumult for a period of three months. Then after three months normalcy was restored.”

(*Tarikh-e-Hasan*, ff. 170a)⁵

A major earthquake in Srinagar and other places, September 1555 AD

According to both Sanskrit and Persian sources there was a devastating earthquake in September 1555 AD in the Kashmir valley, we have previously detailed this earthquake on the basis of the J.C. Dutt’s version (1887) of Suka’s *Rājatarānginī* (Iyengar and Sharma, 1996). This earthquake was during the reign of king Shamsha Shah (1537-1559 AD). Besides Suka, six other historians have described this event. Suka was not only a contemporary but most probably an eye witness to this calamity. His graphical description (Dutt, 1887; Kaul, 1966) states.

(Original Sanskrit version is given by Suka)⁶

- (i) “In the month of Asvina of the year 30, there occurred frequent earthquakes on account of the wicked acts of the king, as if the earth suffered from flatulence. The planet which causes calamity is assuaged by various acts, by gifts of lands to independent people, by giving back to men their properties which had been robbed and by like deeds. Now there occurred an earthquake at the second watch of night when all men were asleep, and it destroyed many people. It caused holes in the ground, and travellers going on their way were misled at every step. Houses fell into these holes at night and people, anxious to get out from their houses in the morning, issued by breaking through the roof. On this occasion wooden houses fell into the water of Vitasta, and when they had floated down for seven kroshas, the people who were in them awoke and came out. The confusion caused by the earthquake in two towns of Hastinapura and Hosainapura, situated at some distance across the river, can be seen even to this day. Pitiable cries of lamentation of the much afflicted people were then heard calling out “O father!”, “O mother!”, “O friend!”, “O brother!”, in different places, which

made the heart feel as if it were struck by a thunderbolt. At this time the sky appeared terrible with claps of thunder, the movement of the stars were stopped, and the land was agitated like a ground on the waves. The mind of the people became troubled with the fear of earthquake, and they felt no affection for sons or friends or wives or for good men or for kind hearted people or for any object whatever. It was owing to the glory of the holy shrines of Vijayeshvara Martanda and Varahakshetra, that fears and apprehensions from earthquake were not felt by the inhabitants of these places. The earthquake continued for several days, occurring several times every day, and all the people lived under canvas".

(*Rājatarangini*, (tr.) III, pp. 380-82)

The year 30 is Laukik year used in the *Rājatarangini* and the month Ashwin corresponds to September. The corresponding year is 1555 AD.

(ii) Nizamuddin Ahmad, appointed Bakhshi of the empire by Akbar, states in his *Tabaqat-E-Akbari* that:

"In the year 962 H. there was a great earthquake in Kashmir and many villages and towns were destroyed. The villages of Jalu and Dampur with their buildings and trees were removed from one bank of the Bihat (Jhelum) to the opposite bank; and in the village of Mardar which is situated at the foot of a hill, owing to a land slip about sixty thousand people perished."

(*Tabaqat-e Akbari*, II, p. 622)⁷

The year given by Nizamuddin Ahmad is 962 H and the September of 1555 AD falls with 962 H. *Tabaqat - e Akbari* is regarded as an important source of history from the time of Subtagin to the thirtyeighth year of Akbar's reign, 1593-94 AD.

(iii) The *Tarikh-e Ferishta* (or *Gulshan-e Ibrahim*) by Ferishta Muhammad Qasim Hindu Shah Astarabadi also records this earthquake. This general history of India covering period from 1015 AD to 1607 AD is superior in many ways and considered an important source material. It records that:

"In the year 962 H a severe earthquake occurred in Kashmir. Many villages and towns were destroyed. On this occasion the hamlet of Nilu and Adampur situated on this side of the river Bihat with their buildings and trees were being transported and appeared on the other side of the river and the village of Mawar which is situated below the mountain, due to the falling of the mountain over it about six hundred people lost their lives".

(*Tarikh-e Ferishta*, II, p. 359)⁸

The year of earthquake is 1555 AD (962 H)

(iv) Haider Malik Chadura Raisul Mulk in his *Tarikh-e Kashmir* records:

“During the reign of Habib Shah in the year 960 H. an extraordinary and unique earthquake occurred. It brought to mind the memory of the ‘Dooms Day’. Of the many uncommon occurrences of this earthquake is, sinking of many houses under the ground. The residents of these houses came out through the openings of the roof with which the people of Kashmir are accustomed. On all sides ruins and debris of houses were visible due to the shock of earthquake. Among other extraordinary happenings, whose authenticity is on the narrator of this event, is a tradition that in mauza (village) Bilarah (Bijbehra) of Miraj division, near the pass of Nandmarg, there were two hamlets Hasanpur and Husainpur, which were situated on both sides of the river of the town (Bihat). Both of these hamlets changed their sides from left to right and from right to left at midnight, with their houses and residents. Husainpur which was situated on the side of the river (right) in its place Hasanpur was transported and Hasanpur which was situated on the left side of the river in its place Husainpur was transported. Still the residents of the left side though reside on this side (right) cultivate their fields on the other side (left). Besides this details of other earthquakes have also been reported from the Kashmir valley in the same way. If the entire description is mentioned here it will appear like an exaggeration. The earthquake continued for seven days”.

(*Tarikh-e Kashmir*, ff. 158a, b)⁹

It should be noted that unlike earlier three references here the year is 1553 AD, as the Hijri era given by Hider Malik is 960. This seems to be incorrect and more reliance is to be put on the earliest source, the *Rajtarangini* which gives the year of the event as 1555 AD.

(v) Narayan Kaul Ajiz in *Tarikh-e Kashmir* records that:

“During this time (year 960 H) an unusual and great earthquake like the earthquake of the ‘Day of Judgement’ occurred. The earthquake continued for seven days. Many well founded and strong houses were destroyed. Unusual details of the earthquakes have been narrated. The description is beyond comprehension logically. But when the curtain of facts is raised one is bound to connive at exaggerated details as there is nothing impossible for Omnipotent God. The narrator of this tradition is responsible for the correctness of the report. It is reported that there were two hamlets towards Miraj in the township of Bijbehra adjoining Nandmarg pass, on the banks of the river Vesav (a tributary of Jhelum). One of them is on this side of the river and the second is on the other side with well populated and cultivated land. One is named Hasanpurah and the other Hussianpurah. Due to the occurrence of earthquake houses of Hasanpurah shifted on this side of the river and houses of Hussianpurah shifted to the other side of the stream. From that time it has been the practice of the farmers of these two hamlets that the farmers of this side go to the other side and of the other side come to this side of the river for the cultivation of their fields.”

(*Tarikh-e Kashmir*, ff. 75b, 76a)¹⁰

It may be noted that in the above reference also the year is 960 H. i.e. 1553 AD which is to be discarded in favour of the year 1555 AD. Narayan Kaul's history is considered a comprehensive work but it is based on earlier works including the *Tarikh-e Kashmir* by Haider Malik. Narayan Kaul has taken the same year (960 H.) for this event after Malik.

(vi) Khwaja Muhammad Azam Deedamari states in *Waqiat-e Kashmir*

"An extraordinary event happened in the city of Kashmir by the will of the great Creator this time (960 H.). A continuing violent earthquake shook the people of the town at Kashmir as if it is earthquake of the 'Day of Judgement'. Houses with their residents were swallowed up by the earth. Few people could save their lives through openings. This catastrophic cycle remained for a week. Uncommon incidents happened during this period. Among them one is like this. At Pargana Miraj in Mauza Bijbehra near the Nandimarg pass Hasanpur and Husainpur two villagers are situated on the opposite banks of the river Bihat. At midnight the land of well populated villages sank down and in place of Hasanpura, Husainpura and in place of Husainpura, Hasanpura appeared. Still the practice of cross cultivation (of these two villages) verifies this incident. This incident is still famous among the village folks".

(*Waqiat-e Kashmir*, ff. 94a)¹¹

In this reference also the year is 1553 AD (960 H.) which is not accepted as discussed earlier.

(vii) Pir Hasan Shah in *Tarikh-e Hasan* states:

"This is the fourth incident of the earthquake in the Kashmir valley, during the period of Ismail Shah (in 960 H.). A severe earthquake occurred as if the earthquake of the 'Doom Day' has occurred. Residential houses with their residents were swallowed up by the earth at many places. Various houses were razed to the ground, wide cracks appeared at many places on earth. Some earlier springs disappeared and some new springs gushed out from the ground. The tremor of earthquake remained for a week but it took two months for the restoration of complete normalcy. Uncommon incidents have been reported during this earthquake. In the pargana of Adone (Adavin) near Nandi Marg Pass, there were two mauza namely Hasanpurah and Husainpurah on the banks of the river one mile far from each other. At midnight the populated area of these two villages exchanged their sides. In place of Husainpura, Hasanpura was shifted and in place of Hasanpura, Husainpura appeared. Now at present the cultivable lands of Husainpura is on Hasanpura side and the residential area of Hasanpura is situated on Husainpura side. In between these two villages river Vaisho flows. This incident has become a legend for the people of Kashmir. In the pargana of Kamraj district Marvardan, a portion of mountain rolled down and six hundred people lost their lives".

(*Tarikh-e Hasan*, ff. 170a, b)¹²

Pir Hasan Shah also gives the year as 960 H. i.e. 1553AD.

It may be noted that this earthquake is described in the *Rājatarangini* and six other histories in Persian language. Detailed description by several historians amply testify that the earthquake was an important event on account of its severity, destruction and wide fault area. As already discussed the date is September 1555 AD and the year 1553 AD according to four Persian sources is not accepted in view of the better reliability of the earliest Sanskrit source viz. the *Rajatarangini*. The name of Srinagar is not mentioned specifically but historians very often called Srinagar by the name of simply Shahr or Kashmir and sometimes even Shahr-E- Kashmir. Besides Srinagar the hamlets of Hasanpur and Husainpur on the banks of the river Vasav or Veshau, a tributary of Jhelum in the pargana of Adavin near the town of Bijbehera of Miraj division were extraordinarily affected by this earthquake. Bijbehera is about 50 km south west of Srinagar. The three historians - Nizamuddin Ahmad, Ferishta and Pir Hasan Shah have recorded that the village Maru Petgam, in the valley of Marvardan, about 140 km south east of Srinagar, was completely devastated.

According to Suka's account in *Rājatarangini*, the holy shrines of Martanda, Vijayeshwara and Varahakshetra were not affected and people were safe in these areas. Varahakshetra or Varahmula is presently Baramula. The shrine of Martanda is about five km east of Anantnag. It is suggested that the earthquake did not affect the Anantnag area which lies between Bijbehra and Maru petam, or may be that damage was small in this area. Regarding the description of the earthquake that Hasanpur and Husainpur were so extraordinarily affected that these two villages exchanged positions by shifting to opposite banks is difficult to believe. Perhaps it is an exaggeration which might have persisted as a legend and recorded by historians. The descriptions are indicative of large changes of ground levels and line of sights. The MM intensity could be assigned as XII.

Newall (1854) while recording this calamity has stated that the river Jhelum changed its course. This statement is incorrect. Actually, it was the river Vesha (or Vasav, ancient Visoka) which changed the course (Parmu, 1969). Vasav is a tributary of the river Jhelum.

An earthquake in Srinagar, 1560-61 AD

There is a passing reference (Dutt, 1887) that during the reign of Ghazi Shah who ruled for two years only, that:

“The king saw conflagrations in different directions and there occurred earthquakes....”

(Kings of Kashmir, Vol. III, p. 387)¹³

An earthquake in Srinagar, during 1569-77AD

This was during the reign of Ali Shah. No specific year is mentioned. It is stated passingly (Dutt, 1887) :

“... The world showed symptoms of a calamity and trembled, as if unable to bear the weight of famine,.....”

(*Kings of Kashmir, Vol. III, p. 394*)¹⁴

An earthquake in Srinagar, 23rd June 1969 AD

(i) Muhammad Mustad Khan Saqi in *Masir-e Alamgiri* reports: “Report of an incident from Kashmir has been submitted before the king that on Wednesday 3rd Safar, 1080 H. (June, 23rd 1969) an earthquake occurred in Kashmir from evening to the next morning. The buildings rocked like cradles but there was no report of any calamity”.

(*Masir-e Alamgiri, p. 87*)¹⁵

(ii) Pir Hasan Shah also records this earthquake in his *Tarikh-e Hasan*:

“During the governorship of Saif Khan on 3rd Safar, 1080 H. (June 23rd, 1669 AD) an earthquake occurred (in Kashmir) from evening to the next day morning. All buildings were swinging like cradle, but there was no loss of life”.

(*Tarikh-e Hasan, ff. 170a*)¹⁶

Both the historians have given almost the same description. The descriptions state that buildings rocked like cradles but there was no loss of life. The MM intensity may be IV or V.

A severe earthquake in Srinagar, 1678-79 AD

In *Tarikh-e Hasan*, Pir Hasan Shah states:

“During the governorship of Ibrahim Khan, first of all heavy floods occurred, which was followed by the calamity of a severe earthquake. Houses were destroyed and living souls lost their lives. Due to the persistence of the earthquake for a long time people were shaken. Those who were affected by earthquake constructed their separate (new) houses. The chronogram of the earthquake is *Thghyani-e Behad* (unlimited inundation)”.

(*Tarikh-e Hasan, ff 172b*)¹⁷

The chronogramic value of ‘tughyani-e-behad’ is 1094 H which gives the corresponding year of 1683 AD. It is stated that the earthquake followed the severe flood for which the date mentioned is 1089 H. and on this basis the year of earthquake comes 1678-79 AD which is agreed by Newall (1854) also. Parmu (1969) who has given 1683-84 AD on the basis of chronogram seems to be incorrect. The MM intensity of this earthquake might be VII.

A destructive earthquake in Srinagar and neighbourhood, 24th March, 1736 AD

Pir Hasan Shah has reported in *Tarikh-e Hasan*:

“During the governorship of Dil Diler Khan a severe earthquake (in Kashmir) reminding the actual ‘Day of Resurrection’, on 22nd Ziqad 1148 H. (March 24, 1736 AD). With one spontaneous motion (of the earth) buildings of the city (Srinagar) and its hamlets were razed to ground. The earthquake persisted for three months, but it was not so violent (in intensity) as it was in the beginning. Daily during the night and day tremors were felt a few times. People were so desperate that they lost the hopes of their lives. The date of this earthquake has been obtained from (the chronogrammatic value) of the Quranic verse (33: 18) “There the believers were sorely tried, and shaken with a mighty shock”.

(*Tarikh-e Hasan*, f. 170b)¹⁸

From the description it will be noted that the initial shock was very strong and destructive. Aftershocks continued for three months. The MM intensity may be estimated to be VIII.

A severe earthquake in Srinagar and neighbouring villages, 1779AD

Pir Hasan Shah records in *Tarikh-e Hasan*:

“During the rule of Karimdad Khan an earthquake occurred in 1193 H. Various houses of the city (Srinagar) and villages were flattened to ground in one tremor. The earthquake wrecked havoc among the people for half a month. On account of this earthquake people took shelter in open area”.

(*Tarikh-e Hasan*, ff. 170b)¹⁹

It may be noted that Baird Smith (1843) reports an earthquake in 1780AD in Kashmir without any further details about the source of information. The year 1193 H. extended from 19th January 1779 to 7th January 1780. If the earthquake occurred during the first week of January 1780, it will fall in 1193 H. In the absence of any other evidence the year 1779 AD which extended over almost the whole of 1193 H seems to be the correct year. This earthquake might be of MM intensity VII.

A destructive earthquake in Srinagar, 1784-85 AD

Pir Hasan Shah in *Tarikh-e Hasan* records:

“During the reign of Azad Khan in 1199 H (1784-85 AD) an earthquake struck the city (Srinagar). Most of the people of the city were thrown swinging in up and down motion. This condition remained for six months. Various residential houses and countless number of lives were lost.

(*Tarikh-E Hasan*, f. 170b)²⁰

The reign of Azad Khan and events of his times are recorded by Parmu (1969) also but *Tarikh-e Hasan* is the only source recording this earthquake. MM intensity might be VIII. The year 1199 H. corresponds to November 1784 to October 1785 AD.

EARTHQUAKES IN ASSAM

There are various sources for history of Assam. Information on earthquakes is found in some *Buranjis* which are unique sources of history of Assam. These are chronicles in Ahom, Sanskrit and Assamese languages and were compiled and updated by appointed officers of the court or other scholars from time to time. In the *Buranjis* the cycle of years is counted on the pattern of Jovian Calendar of 60 years. Besides the *Buranjis*, another important secondary source of history is the classic work, *A History of Assam* by Edward Gait, who was the first to write a comprehensive history in 1905. There are several later compilations but they have little information on earthquakes.

The earthquakes found in the above references are presented below in chronological order:

An earthquake at Garhgaon, 1548 AD

The *Ahom-Buranji* (Tr. and Ed. Barua, 1930) states:

“In Lakani Tao-Shinga (i.e. in 1548 AD) a violent earthquake took place, pebbles, sand and ashes came out bursting the surface of earth...”

(*Ahom Buranji*, pp. 81-82, para 61)²¹

This earthquake was during the reign of the king Suklemung who made his capital at Garhgaon and therefore known as Garhgaya Raja. Gait (1905) also mentions this earthquake. The intensity of this earthquake might be IX. Garhgaon is south east of Sibsagar and its location is approximately 26°45' N, 94°50' E.

An earthquake at Gajala (7) in 1596AD

Basu (1970) states :

“In Lakni Khutshinga (i.e. 1596 AD) a terrible earthquake took place. How water, sand and ashes and pebbles burst out from the interior of the earth all over the country. The sentry of the royal place met death”.

About the same earthquake Gait (1905) states:

“There was another bad earthquake in 1596. Hot water, sand and ashes were thrown up from below. One of the king’s palaces collapsed and some of the men who were guarding it were crushed to death”.

This earthquake was during the reign, 1552 to 1603, of Sukhampha alias Khora (lame) Raja. The damage referred to is perhaps at Gajala where the king had one of his palaces. The MM intensity of this earthquake might be around IX.

Several earthquakes in upper Assam in 1642 AD

In A History of Assam, Gait (1905) states:

“There was a heavy flood in 1642 in which many cattle, were washed away and drowned. Several earthquakes occurred in the same year”.

These earthquakes were during the reign of the king Suramppha alias Bhaga Raja alias Jayaditya who ruled for a short period from 1641 to 1644. There is no information about the damage. The intensity might be III.

Three earthquakes in Upper Assam in April-May, 1649 AD

The *Satsari Buranji* (Ed. Bhuyan, 1960) records that during the reign of Jayadhwaj Singha alias Sutamala (1648 AD to 1663 AD) in Saka 1571 (1649-50 AD) in a fortnight of Vaisakha three earthquakes were felt. As the month of Vaisakha corresponds to April-May, the year is 1649 AD. The earthquakes are reported as ‘felt’, the intensity might not be exceeding III.

Mild earthquakes Kajali, near Gauhati, 1663 AD

This event is listed in the catalogue by Bapat et al. (1983). The eye witness account of Shihabuddin Ahmad Bin Muhammad Wali Talish, the author of *Fathiya-E Ibriya* is as given below:

“In the evening of February 7th, 1663 AD the same day on which the mother of Raja of Dumuria had visited the (Mir Jumla’s camp) clouds appeared in the sky and at the periphery of the horizon. Tremendous lightning and thunderous storm came from the hill side, and immediately afterwards, a strong earthquake shook the earth (encamping ground). The earthquake involuntarily shook all whether they were sitting or standing, reclining or sleeping. All people were terribly frightened. the shocks continued for half an hour. On February 9th, the Nawab set out from Kajali and encamped at Pandu which lies opposite to Gauhati on the banks of a river”

(*Fatehiya-e Ibriya*, pp. 186-87)²²

This earthquake occurred during the last days of king Jayadhwaj Singh alias Sutamala and the above account is while Mir Jumla was returning from the campaign of Upper Assam. Gait’s History of Assam also mentions this earthquake. The MM intensity might be around V.

A strong earthquake at Sadiya in Feb.-Aug., 1697 AD

The *Tungkhungia Buranji* (Ed. and Tr. Bhuyan, 1933) records:

“In the month of Puh 1618, Bandar Phukan of the Chetia family constructed a fort at Puingdang under the orders of the king which took two months. In the same year there was an earthquake which continued for six months in an abortive fashion, from Phagu to Saon. The earth was rent as under at Sadiya, and magur and kawai fish appeared in the breaches. As sands and water appeared at that place the sides of the hills crumbled down.”

The year in the above account is Śaka era which starts 13/14 April. The corresponding year is 1696-97 AD. In the Solar calendar followed by Bengal and Assam Phagun starts on 13th February and Saon (Sravana) ends on 16th August. The earthquake should have occurred towards the end on 16th August. The earthquake should have occurred towards the end of Śaka year 1618 i.e. February 1697 AD and continued upto August in the same year. This event was during the reign of the king Swargdeo Rudra Singh alias Sukhrangpha who ruled during 1696 AD - 1714 AD. Sadiya, 27°48'N, 94°38', where the earthquake occurred is in Arunachal Pradesh of present times. The description of the effects indicate an intensity not less than X.

An earthquake at Tingkhang and Charaideo Hill in 1714 AD

The *Tungkhungia-Buranji* records:

“The stone domes situated at the two doors of Bhagra gate were broken by some mysterious agent at night. The domes of the temple at Tinkhang were also broken as well as those at the subsidiary temple on the Charaideo Hill”.

(*Tungkungia-Buranji*, Ch. IV., p. 26)

Very likely the damage to buildings could be due to an earthquake. The year is not mentioned. But it may be towards the close of the reign of the king, Rudra Singh in 1714 AD. Perhaps Gait (1905) refers to the same event in his narration:

“... At this moment a severe earthquake occurred which shattered several temples; and Rudra Singh interpreting the phenomenon as an indication that the Mahant was a real favourite of the gods, hastened to recall him”.

Charaideo is in upper Assam, south east of Sibsagar. The cracking of well built buildings may be taken as indicative of an intensity IV.

An earthquake in Upper Assam (Rangpur) in 1759 AD

The *Ahom-Buranji* records:

“... Next year in the month of Dinruk (Baisakh) an earthquake took place”.

This earthquake is said to have been preceded by a solar eclipse in 1758 AD in the month of Dinkam (Puh) on the day of Kapalo (Saturday). Thus the year of earthquake is 1759. This was during the reign of king Rajesar Singh alias Surampha, who ruled during 1751 AD - 1769 AD. No details of damage are given. The place might be Rangpur which is 25°45', 89°22'E.

EARTHQUAKE FROM OTHER PARTS OF INDIA

Historical records show that earthquakes have occurred in the past, almost all over the Indian subcontinent, even though greater seismic activity had been observed in the Himalayan region. Some important earthquakes which are not listed in current catalogues are summarised below:

A destructive earthquake at Agra and in North-West India on Sunday 6th July, 1505 AD

This earthquake is very well described in primary sources. The authors of five different histories in Persian have recorded this earthquake. Their narrations are given below:

(i) Mulla Abdul Qadir Badani wrote *Muntakhab-ut Tawarikh* which is a general history of India from the time of Subuktagin to the 40th year of Akbar's reign. He completed this history in 1004 H. (or 1596 AD). His account is considered an important contemporary source of emperor Akbar's reign. Mulla Badaoni states:

“On the third of the month of Safar in the year 911 H. (6th July, 1505 AD) so violent an earthquake occurred over the whole of Hindustan that the hills began to tremble, while strong and lofty buildings fell to dust and the earth in places cleft and cracks appeared, while they assert that villages and trees left their places. People supposed that the day of resurrection had arrived. We learn from the memoirs of Babur and other histories, that this earthquake was not confined to Hindustan alone, but that was felt just as powerful in other countries also. I found the word *Qazi* has a chronogram to record its date. (The chrographic value of qazi is $100 + 1 + 800 + 10 = 911$). ‘In nine hundred and eleven the city of Agra became the goal of several successive earthquakes. And whereas her buildings were excessively lofty that which had been highest points became the lowest’. From the time of Adam to the present time no such earthquake has ever been known”.

(Muntkhabt-ut Twarikh, I, pp. 319-20)²³

(ii) Nizamuddin Ahmad authored *Tabaqat-E Akbari* which is a general history from the time of Subuktagin to the 38th year (1593-94) of emperor Akbar's reign. He was an appointed Bakshi of the empire of Akbar. He states:

“On the 3rd of the month of safar in the year 911H. (6th July, 1505 AD) on Sunday, severe earthquake struck Agra. The hills began to shake and lofty and solid buildings were razed to ground. The living being supposed that the day of resurrection has come and the dead thought that the day of judgement has arrived. In nine hundred and eleven the city of Agra became the target of several successive earthquakes. And whereas, her buildings were lofty due to earthquake the highest became lowest. From the time of Adam till this time such an earthquake had never occurred in Hind and no one even remembes such an earthquake. They say that on this very day there were earthquakes in many cities of Hindustan”.

(*Tabaqat-e Akbari*, p. 165)²⁴

(iii) The *Tarikh-e Khanjahani wa Maqhzan-Al Afghani* by Khwaja Niamtullah Harvi is a history of Afghans particularly the Lodis and Surs from legendary times to 1613 AD. The author was a news writer in the court of Jahangir. He records:

“During this time a severe earthquake occurred at Agra on 3rd of Safar 911 H. (July 6th, 1505 AD) on Sunday. That the hills trembled and lofty buildings came down. A large number of human beings lost their lives. The living people thought it a day of resurrection and the dead the day of Judgement. From the time of Adam to this day earthquake of this intensity did never occur in Hindustan. It is also reported by people that on this very day earthquake struck various cities of Hindustan”.

(*Tarikh-e Khanjahani Makhzan-al Afghani*, pp. 196-97)²⁵

(iv) The *Tarikh-e Daudi* by Abdullah was written during the time of Jahangir and it gives an account of the Afghan rulers in India based on tradition and verbal reports. In this history Abdullah records:

“This time a great earthquake occurred at Agra on the 3rd of the month of Safar in the year 911 H. (6th July, 1505 AD) on Sunday. Consequently the mountains started to tremble and lofty and strong buildings were crumbled. The living people supposed it the day of resurrection and dead supposed it the dooms day. Poets have composed verses in the memory of this earthquake. One of the verses is quoted here - “In the year nine hundred and eleven the city of Agra became a goal of several successive earthquakes. From the time of Adam till the time of Sultan Sikandar earthquake of this nature did not strike India and no one even remembers such an earthquake, before the occurrence of this earthquake in India”.

(*Tarikh-e Daudi*, pp. 60-61)²⁶

(v) *Tarikh-e-Ferishta* (or *Gulshan e Ibrahim*)

The *Ferishta* is considered a very important source material for the medieval history of India. It has twelve chapters in addition to an introduction and covers the history of India from oldest times to 1015 H. (1607 AD). Regarding the earthquake *Ferishta* records:

"In the year 911 H on 3rd Safar on Sunday (6th July 1505 AD) a great earthquake occurred at Agra, so that the hills shook to their bases, and lofty and solid buildings were levelled to ground. That the living people thought it the day of resurrection and the dead the Dooms Day. In the year nine hundred and eleven the city of Agra became a target of several successive earthquakes and whereas her buildings were lofty that which had been highest points became the lowest. From that time to this time earthquake of this type did not occur in India and nobody even remembers that and there is no trace either. On that day earthquakes have been reported from various cities of India".

(*Tarikh-E Ferishta*, I, p. 183)²⁷

All the five sources are unanimous about the occurrence of the devastating earthquake at Agra on 6th July, 1505 AD. Only Agra is mentioned by name but the earthquake is said to be over a vast area and not confined to India alone. It is interesting to note in the well known historical Hindi novel *Mrignayani* by Vrindavan Lal Verma which deals with the period of Man Singh Tomar who ruled from Gwalior during 1486 AD to 1516 AD narrates a devastating earthquake in Gwalior, Mandu and other areas. But no date is mentioned. It seems that apart from Agra, the cities of Gwalior, Dholpur, Mathura and Delhi too were affected by this earthquake and its influence extended in the whole of the north-west India and Afghanistan. Agra is 27°11'N, 78°02' E. Gwalior is 26°14' N 78°10'E. The MM intensity of the earthquake at Agra might be XII.

Four shocks at Billankote in August, 1507 AD

A stone inscription in Kannada script in the village Billankote (Nelamangla taluka) near Bangalore records:

"In the year Kali 4608 Prabhava Samvata of Sravana Sudh Shasti Thursday earth shook four times".

The traditional Kali (Kaliyuga) year is 3101 years prior to the start of AD and the bright lunar half of the month Sravana will fall in August. Thus the event was in August, 1507 AD. No other details are given. It might be a mild earthquake of MM intensity not exceeding IV.

An earthquake at Surat, 29th August, 1636 AD

President Methwold's Diary for August 8 to October 11, 1636(Ed. Foster, 1913) recording the event of 29th August, 1636, states:

“Whilst I sat writing, Chout our broker and our Persian scribe being both near upto me, the flower of the chamber under me and the wall against which I leaned continued to move so long as to give occasion to seek what might be the cause; but finding none visible, I demanded of them who were with me what they felt; who were yet not recovered from their wonder, who answered that they felt the like motion and so did diverse others that sat so near as to answer unto the said question, and so many more in the house and towns besides as to confirm me that it was the first earthquake that ever I was sensible of. It continued whilst a man might deliberately tell sixty, with a gentle equal motion, and therefore, I hear of no hurt that happened by it’.

*(President Methwold's Diary, August 8 - October 11, 1636,
English Factories in India, Vol. V, p. 514)*

The narration tells that the earthquake was felt by every one and the shock lasted for a duration in which counting upto 60 was possible. Thus the time interval was about 30 seconds. The MM intensity may be III.

Severe tremors at Bijapur, 1653-54 AD

Muhammad Ibrahim Zuberi, author of the *Basatin-us-Salatin*, a history of Bijapur from the origin of the dynasty to its last representative records:

“In the year 1064 H.(1653-54 AD) water was brought inside the fort from Begam Talab by the efforts of Afzal Khan. The canal is named Ab-e-Fazal Nida and in the same year a severe tremor occurred and in the same year Ellora was conquered”.

(Basatin-us Salatin p. 346)²⁸

The record does not tell about damage etc. the MM intensity might be III. Bijapur is 16°51'N, 75°44'E.

An earthquake at Mandaran (West Bengal), 4th June, 1669 AD

This earthquake is recorded in *Mirat-e Alam* by Bakhtawar Khan. He states:

“On the fourteenth of Muharram of the twentieth regnal year of the exalted (Aurangzeb), (June 4, 1669AD), a violent earthquake shocked the area in the vicinity of the ‘fort’ of Mandaran. Due to the intensity of the earthquake there appeared a crack of 50 zira ($50 \times 32'' = 1600'' = 133'$) in length and two yards

broad on the ground. The inhabitants tied stones to a rope of five and six hundred years long (to ascertain the depth of the crack). But the stones could not touch the bottom of the ground and the depth could not be ascertained (apparently the crack was about more than 1800' deep). After few days without any apparent reason the crack joined together and topography of the land changed all of a sudden.

(*Mirat-e Alam*, 505)²⁹

For the same date and place the earthquake catalogue (Bapat et al., 1983) shows an entry but the place is shown in Punjab (India), after Oldham (91883). The location of Mandaran in Punjab is incorrect. According to *Ain-e Akbari* by Abul Fazal. Mandaran was in Bengal and its constituent districts, of present times, were Burdwan, Vishnupur, Bankura and West Hugli. Headquarters of this Mandaran region was Garh Mandaran (Irfan Habib, 1963 and 1982) also known as Bithurgarh. The record of *Mirat-e Alam* says that the earthquake was in the vicinity of fort of Mandaran attests to the place name of Garh Mandaran or ancient Bithurgarh. Garh Mandaran is 22°53'N, 87°40'E on the bank of the stream Amudar.

The earthquake created large fissures but damage is not recorded. The MM intensity may be IX.

An earthquake at Balasore on 26th August 1676

Streynsham Master (1675-1680 AD) records in his *Diary* for 26th August, 1676 AD:

“... About two O'clock we got to Balasore, where I was received with all due respect. This morning about five O'clock there happened an earthquake we were very sensible of aboard the ships, in the road it has much shaken the houses of the Town,”

(*Vol. I, p. 300*)

Balasore (31°30' N 86°55' E) is a port town of Orissa. It was the centre of the one of the earliest English factories established in 1642 AD in the Bay of Bengal. The earlier name was Balesvara (also Balesar) with reference to Lord Krishna. The MM intensity might be IV.

An earthquake in Chittagong on October or September, 1676 AD

Streynsham Master (1675-1680 AD) recording his transactions at Hugly writes for 21st September, 1676 AD:

“Chittagong, being lately destroyed by a hurricane and an earthquake, which was formerly taken from the Arrackaners by the assistance of the Dutch”

(*Vol. II, pp. 40-41*)

From the recording it can be concluded that the earthquake was earlier to the date in the *Diary*, (say) October or September, 1676 AD. Chittagong, 22°20' N, 91°50' E is in Bangladesh. The Arrackaner (Arakan or Arracan) is now in Burma (Myanmar).

A moderate earthquake at Madras (also in Begel Coromandal and Arakans) on 28th January, 1679 AD

Streynsham Master's Diary records 28th January, 1679 AD at the port of Fort St. George (Madras):

“On the night of 28th (January), two days before the Captain received their sailing orders, there is a note of an earthquake which continued about half a quarter of an hour, but praised God it did no harm”.

(Vol I, p. 74)

The above statement is attributed to Mackenzie and it seems that Streynsham Master was also present at the Fort St. George at that time. Streynsham Master in his entry of 1st May 1679 AD makes an important observation. He states:

“One thing remarkable we learnt at Policat which was by advices from Tanassaree, Pegu, Arracan and Bangale, the earthquake which happened the 28th January last, also in all them places and upon all the coast of Charonomandell at one and the same minute of time.”

(Vol. II, p. 182)

The occurrence of this earthquake was on a very wide area, Arakan (Burma), Bengal (Bangladesh) and India and Coromandal coast (eastern coast of India) were affected simultaneously on the same date (28th January, 1679 AD). Tannassaree (Tannasserim) and Pegu (17°20', 96°29' E) are sea ports in the delta of the river Irawadi of Burma (Myanmar). Fort St. George (Madras 13°04', 80°15' E) is on Coromandal coast. It might be that Bay of Bengal too was affected by this earthquake. At Madras it did not cause any harm and MM intensity might have not exceeded IV. But at other places it might have been higher.

A disastrous earthquake at Goga (Gujarat) in February, 1705 AD

Manucci in his *Storia Do Mogor* (or Mughal India) states:

“In 1705, in the month of February, there was a terrifying occurrence in the province of Gujarat. In the district of Goga (or Gogo) there was such a trembling of the earth that the ground opened for a length of five leagues; in some places fissures were from ten to twenty cubits wide, and even as much as thirty cubits. The governor of the country sent men to take measurements of the depth, and they brought back the report that at a depth of fifty cubits they did not reach the

bottom of the cavity. After a few days of these terrible quaking of the earth there came on a rain of blood in drops of considerable size, the earth becoming red and the reservoirs full of it.

“At the same time there appeared a comet, which was visible for fifteen days. The Brahmins and astrologers found herein an occasion for talk, and they declared that these signs were demonstrations of Aurangzeb’s (approaching) death and of devastation in many places in the empire, together with the loss of the port of Surat.”

(Storia Do Mogor or Mughal India, 1653-1708 Vol. IV, p. 233).

Gogo (or Goga) was a town having brisk sea trade. It was situated on the inner (eastern) shore of Kathiawar peninsula. Gogo is now superseded by Bhavnagar, $21^{\circ}46'N$ $72^{\circ}11'E$. The description is very vivid in respect of fissures in the ground. The MM intensity of this earthquake can be put at XI.

An earthquake in Malabar in December, 1784 AD

In the *History of Kerala*, K.P. Padmanabha Menon records:

“... In the month of December 1784 (not very long after our author wrote his letters) a general agitation of the earth was perceived there in the night time, which continued for about two seconds. Such a phenomenon is called in the Malabar language Bhumikulukkam (Bhumikulukham) and in Sanskrit Bhoochalana...”

(Vol. I, pp. 121-122)

A catastrophic earthquake in Sirajganj (Bangladesh) in 1787 AD

In a geographical essay Kamlaluddin and Rahman (1985) state that:

“Sirajganj is a subdivision of the district of Pabna in Bangla Desh, lying on the Western bank of the river Jamuna. Once a very prosperous area of the country in terms of soil and agricultural productivity, the sub-division has undergone substantial physico-geographic changes during the last few centuries since the time of James Rennell. The changes have occurred primarily due to catastrophic earthquake of 1787 and the consequential shifting of courses of the streams in the region”.

The authors have not mentioned the source of their information about the earthquake. Sirajganj is $24^{\circ}27'N$ $89^{\circ}44'E$. The earthquake under reference changed the course of the rivers and the MM intensity might be XI.

SOME EARTHQUAKES NEEDING FURTHER CONFIRMATION

Some earthquakes are reported in archaeological accounts of sites which were abandoned and are buried underground. In several cases the reason for abandonment and sinking of the ground is considered on account of earthquakes but such inferences need further corroborative evidence. Some earthquakes are reported below:

Extinction of Harappan culture sites, 2600 BC-1800 BC

The river Saraswati of Vedic times has been rediscovered and a large number of sites of Harappan culture are located on its banks. Michel Damino (1996) reports:

“.. The great river (Saraswati) has been found again - rather its long dried up bed, traced over the last century by numerous archaeologists (notably V.S. Wankar in the eighties and early nineties), and confirmed by satellite photography. It flowed down from Siwalik hills at the foot of Himalayas, touched the plains near Ambala in Punjab, then ran in a course roughly parallel to the Indus, through the Ghaggar valley, the Rajasthan desert, and finally the Rann of Kutch in Gujarat ..

“It was indeed a mighty river, three to ten kilometers in width, with at one time the Sutlej and the Yamuna as its tributaries; the Saraswati seems to have been fed up by the millenial melting of the ice caps and glaciers accumulated in the Himalayas during the last ice age, which ended about 10000 BC. Detailed studies have shown that the Saraswati changed course several times owing to floods and earthquakes (which probably diverted the Sutlej towards the Indus and the Yamuna eastward); evidence has also been found of a great drought lasting over centuries which caused the Saraswati to break into several segments and finally dry up completely around 2000 BC.”

(Invasion that Never was, pp. 71-74)

Similar observations are made by Prof. H.D. Sankalia (1974):

“Raiks had advanced another explanation for the destruction or abandonment of the Harappan settlement of Kalibangan. Based on his borings of this site in 1963-69, he thought that the first settlement on the Saraswati took place when the Yamuna or one of its arms turned westward in 2600 BC owing to some tectonic movement. Then it turned eastward owing to similar reasons in 1700 BC. This brought about gradual destruction of the site in the Saraswati valley”. (Pre-history and Proto-history of India and Pakistan, p. 390).

Above observations state that the change of the river course was due to tectonic movement. Stein (1989) is also of the view, on the basis of remote sensing, that tectonic uplift of the river bed was the reason of the change in the course of river.

It will be seen that the probable events of these earthquakes were in prehistoric past and dating spreads over centuries. Some further scientific evidence is necessary.

Rise of Makran Coast (Pakistan), 1700 BC

Prof. H.D. Sankalia (1974) observes:

“It would appear that the Harappan cultures on the Makran coast declined because of the fall of five meters of sea level, in association with a rising coast. This made them useless as trading ports by about 1700 BC. Thus the cause was static and tectonic”.

(*Prehistory and Protohistory of India and Pakistan*, p. 390)

Geologists are of the view (Krishnan, 1982) that Makran coast was faulted down in the late Pliocene, but the landward side has been raised and still rising.

Destruction of Kamakhya temple, earthquakes prior to 800-1700 AD

Puranas and Tantras are important sources for reconstructing the early history of Assam. Two important works, the *Kālikāpurāṇa* and the *Yoginītantra* state that there was a calamity (which could be due to earthquakes) and people could not worship the goddess Kāmākhyā. The *Kālikāpurāṇa* is a work of late ninth century AD and *Yoginītantra* of sixteenth century (Shastri, 1996). More or less the *Yoginītantra* reports the story of the *Kālikāpurāṇa* that due to the curse of sage Vaśiṣṭha Kāmākhyā disappeared. The *Kālikāpurāṇa* does not specifically refer to the destruction of the temple of Kāmākhyā. But it is important to note that it mentions of deluge and flood and the change of the course of the river Lauhitya (Brahmaputra) along with drying up of the river bed. Both these sources indicate a big calamity which is strongly indicative of earthquakes. Building/rebuilding of the Kāmākhyā temple is on record, e.g. by Silsrai in 1565 AD. The temple might have been destroyed by earthquakes earlier or during 9th to 16th century also. The description is indicative of MM intensity of X or more.

Earthquake in Rann of Kutch, 1000 AD and prior to it

R.S. Bisht while describing archaeological findings at Dholavira, Kutch observes:

“In this regard, it must be borne in mind that in Kutch is a highly sensitive seismic zone where earthquakes having brought about drastic geomorphological and topographical changes as late as 1819 AD; the western part of the Rann subsided and a result, the Nara and a few other off shoots of the Indus dried up or changed their courses; some parts in the Rann rose up and some others subsided. It is why a few Harappan sites are now at level with the Rann and get submerged in the rising water, while some are perched on the raised banks”.

(*History and Archaeology - Prof. H.D. Sankalia Felicitation Volume*, p. 405)

Occurrence of earthquakes in Rann of Kutch has been noted by Baird Smith (1843) and De Ballore (1934) also.

Earthquake at Brahmanabad (Sindh, Pakistan), 1250-1300 AD

The ruins of Brahmanabad are located in the present district Nawab Shah of Sindh. It was a town of a long past history. Cunningham who surveyed the region observes:

“The excavation of Mr. Bellasis have shown conclusively that Brahmanabad was overwhelmed by an earthquake. The human bones were chiefly found in doorways, as if the people were attempting to escape; others in the corners of the rooms, some upright, with their faces down and some crouched in a sitting posture. The city was certainly not destroyed by fire as Mr. Richardson notes that he found no remains of charcoal or burnt wood, and old walls bore no traces of fire. His conclusion is same as that of Mr. Bellais that the city was destroyed by some terrible convulsion of nature. I would, therefore, assign its destruction to the latter half of that (10th) century and not earlier than AD 970.

(Cunningham's *Ancient Geography*, pp. 315-17)

According to *Tarikh-E Sind* by Masum Nami, Mansurah which was an adjoining city of Brahmanabad was also destroyed by earthquake. Mansurah was a centre of activity upto 650 H. and after that there no reference of activity is available. Thus both Brahmanabad and Mansurah were destroyed by an earthquake sometime in 1250-1300 AD.

Earthquake at Behat, (Saharanpur), Uttar Pradesh 15th century

In the ISET Earthquake Catalogue, Bapat et al (1983) an entry refers to Behat which is shown to be in Punjab, Pakistan. This information has to be verified. Actually Behat is in district Saharanpur, Uttar Pradesh. In 1833 AD, Captain P.T. Cautley, Superintendent of Doab Canal during excavations of the canal came across the ruins of an ancient town near Behat. Nowhere has it been mentioned that an earthquake occurred at Behat in 15th century. Cautley published his account of findings in the journal of Asiatic Society of Bengal in 1934. Behat, also known as Bihat Khajanwar, finds a mention in Akbar's time also and the town still exists. The ruins under reference must have been some settlement near Behat which might have gone underground.

Earthquake in Andamans, prior to 1800 AD (?)

Ballore (1934) observes:

“It is true that seismic information is scarce. Only a few earthquakes are known from the Andaman islands. But their instability can be gathered from the fact that according to portman, the natives only worship two gods, EREMCHANGLA and TURUWINDA, by whom earthquakes and typhoons are respectively ruled”

(*Geological Memoirs, p. 177*)

The belief is obviously an outcome of natural phenomena witnessed by natives since times in remote past.

Table 1 : Earthquakes of Kashmir

S. No.	Year	Felt Place	MM Intensity
1.	*1250 BC	Wular Lake, Srinagar	XII
2.	883 AD	Srinagar	V
3.	1123 AD	Srinagar	-
4.	1501 AD	Srinagar	VII
5.	1555 AD	Srinagar, Hasanpur Husainpur, Maru-Petgam	XII
6.	1560/61 AD	Srinagar	-
7.	During 1569- 77 AD	Srinagar	
8.	1669 AD (23 June)	Srinagar	IV
9.	1678/77 AD	Srinagar	VII
10.	1736 AD (24 March)	Srinagar and neighbourhood	VIII
11.	1779 AD	Srinagar and neighbourhood	VII
12.	1784/85	Srinagar	VIII

* Estimated

Table 2 : Earthquakes of Assam

S. No.	Year	Felt Place	MM Intensity
1.	1548 AD	Ghargao	IX
2.	1596 AD	Ghargao/Gajala	IX
3.	1642 AD	Upper Assam	-
4.	1649 AD (April/May)	Upper Assam	III
5.	1663 AD (7 February)	Kajali	V
6.	1696-97 AD	Sadiya	X
7.	1714 AD	Tingkhang, Charaideo	IV
8.	1759 AD	Rangpur	-

Table 3 : Earthquakes of other parts of India

S. No.	Year	Felt Place	MM Intensity
1.	1505 AD (6th July)	Agra	XII
2.	1663 AD (29th August)	Surat	III
3.	1507 AD	Billankote	III
4.	1653-54 AD	Bijapur	III
5.	1669 AD (4th June)	Garh Mandaran (Bengal)	IX
6.	1676 AD (26 August)	Balasore (Orissa)	IV
7.	1676 AD (Oct./Sept.)	Chittagong	-
8.	1679 AD (28 January)	Madras, Coromandal Arakans	IV
9.	1705 AD (February)	Gogo (Gujarat)	XI
10.	1784 AD (December)	Malabar	-
11.	1787 AD	Sirajganj (Bangla Desh)	XI

Table 4 : Earthquakes needing further confirmation

S. No.	Year	Felt Places	MM Intensity
1.	2600 BC 1800 AD	Banks of the Saraswati of Vedic times	-
2.	1700 BC	Makran coast	-
3.	800 AD - 1700 AD	Kamakhya	X
4.	1000 AD	Rann of Kutch	-
5.	1250 AD 1300 AD	Brahmanabad (Sindh)	-
6.	1500 AD - 1600 AD	Behat (Uttar Pradesh)	-
7.	Prior to 1800 AD	Andaman Islands	-

CONCLUSION

The recent sequence of four strong earthquakes in the country namely Bihar (1988), Uttarkashi (1991), Killari, Maharashtra (1993) highlights the importance of estimating seismic hazards for Indian cities and settlements. In this connection information about past earthquakes is of primary importance for proper assessment of current and future seismic hazard. With this in the background the authors have searched ancient and medieval literature for reference to earthquakes. The ancient sources of India are the Vedas, Purānas and later relevant scientific writings of scholars such as Varāhamihira (5 Cent A.D.) and Vallālasena (10 Cent A.D.). While several theories for occurrence of earthquakes are expounded, these texts are silent on dates and locations. However, both the above treatises contain full chapters devoted to earthquakes, wherein regions of India prone to seismic activity are delineated. Thousands of epigraphs and other inscriptions are available all over India. A laborious scanning has led to only one success, near Bangalore (A stone inscription in Kannada script at Billanakote), records the occurrence of an earthquake in 1507 A.D. with day, date and year (Iyengar, 1994). Thus, our interest shifted to court writings which are known to be available for Kashmir, Assam and Mughal Empire. The results of searching the various records which are in print or manuscripts in their original form or in translation has yielded valuable information on many earthquakes which were hitherto not known in the scientific literature on the subject. All the relevant earthquakes in Kashmir, Assam and other parts of India prior to 1800 AD are listed in Table 1, 2 and 3. Besides these, some earthquakes which need further confirmation are listed in Table 4. The search of diverse sources for information on dated earthquakes, specially for the medieval period, has been fairly exhaustive. But it is quite possible that there exist manuscripts and other materials in Sanskrit and in other languages of India and neighbouring countries which contain further information on earthquakes in historical past.

A list of references quoted in the text is included. Besides this, a bibliography of over one hundred seventy titles of primary and secondary sources of history and other published and unpublished writings which were scanned are given in this report. These appendices are in Persian, Sanskrit and Ahom languages. Their translation in English is given in the report.

It may be noted that the information gathered is rather small in comparison with the vast amount of literature scanned. The total number of manuscripts, books, records and papers, looked into is over two hundred. The number of earthquakes which are so far not recorded in official catalogues is thirtyeight including a few cases for which earlier information has been corrected. The place of occurrence of earthquake with dates are shown on a map given in Fig. I.

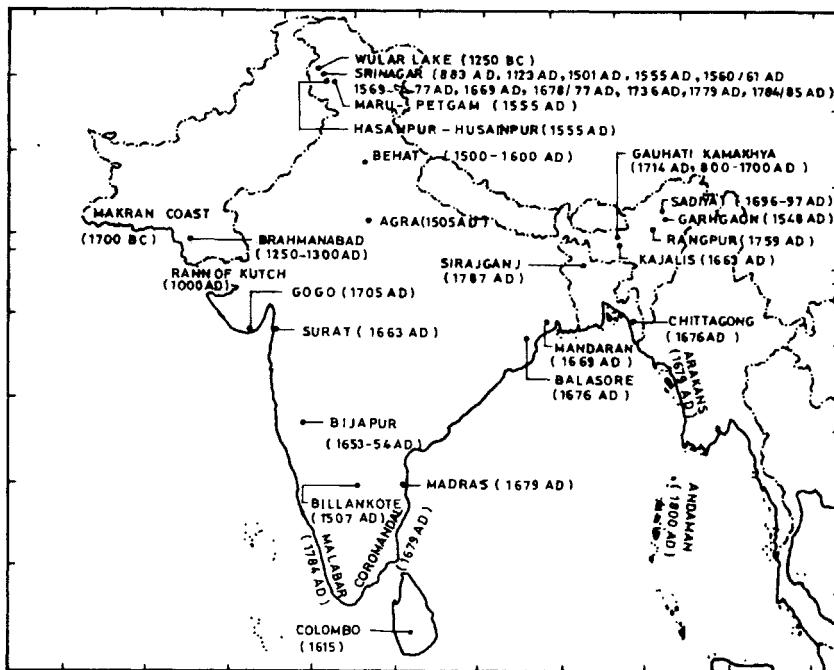


Fig. 1. Places of Earthquake Occurrence prior to 1800 AD

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Notes

1. Extract from *Tarikh-e-Hasan* by Pir Hasan Shah (Wular Lake Earthquakes, 1250 BC).

وقتیکه بجای تالاب اولر شهر سند مت نکرایار بود ساکنان انجا بار نکاب افعال شنیع مورد عتاب کشته در عهد سندرسین شهانه زلزله عظیم واقع شد که تمام شهر ویران کشت و سطح زمین کثیره چشمه⁹⁴⁰ تی همچنان جو شیر که تمامی شهر را در یک آن طوفان ساخت الحال آن چشمه را اولر ناک میگویند بیشتر شروعاً گفته شد :

(تاریخ حسن، ورق 169 ب)

2. Extract from *Tarikh-e-Hasan* by Pir Hasan Shah (Blockade of the river Jhelum due to an earthquake, 883 AD).

مانعه روم در عهد راجه اونتی فرما سمعت⁹⁴⁰ شهانه زلزله عظیم واقع شده باره⁹ از کوه کباره نیار که بطرف باره موله است در قعر دریای بہت خلطیده منفذ آب مسدود کرد اندید و سطح زمین را تا مقام بیجه باره فرق سیلاب نمود و تمامی رهات و مزروعات نیاه شدند انکاه بندبیر سو رانا منکهای کوه از مقعر آب کشیده آب را بدر روداره ساخت زمین نمود ار شد :

(تاریخ حسن، اوراق 169 ب 170 الف)

3. Extract from *Rājatarangini* by Kalhan (Blockade of river Jhelum, 883 AD)

यत्थानादिनियमैत्तं सतां दृश्यंगमम् ।
 गोष्ठापु विशदप्रमं विद्युताः पर्याप्तार्यन् ॥ ७९ ॥
 तेषां कथावश्वस्थासु निन्द्रतां जलविग्रहम् ।
 धारिति मे तिर्यक्षेत्रे किं कुर्यामिति सोऽव्यवीत् ॥ ८० ॥
 उन्मत्तस्येव वदतत्त्वस्य तद्वियमादचः ।
 निशम्य भृशार्द्धधिरमासीत् सविस्यः ॥ ८१ ॥
 तत्सामानीय त्राः किं क्वप् इति वृष्टवान् ।
 वीरस्तीत्यादि राजामेऽव्यवोचत्तरोऽव्यसंधमः ॥ ८२ ॥
 वात्तुलोऽसाविति निजैरूलोऽव्यध महीपतिः ।
 पिर्य दिद्धुविन्देत तस्यापत्तं निजं धनम् ॥ ८३ ॥
 कोशादीनारभाण्डानि पह्न्यादाप्य देलया ।
 यद्यो गद्यरात्रे स नावमारहा रंहसा ॥ ८४ ॥
 प्रामे तत्र प्रहृदाम्बुनिमाने नन्दगमिष्ये ।
 एकं निक्षिप्य वीनारभाण्ड व्यावर्तत द्रुतम् ॥ ८५ ॥
 सत्यं वात्तु एवाऽसौ सम्येष्वपि वदत्तस्वपि ।
 चाती निशम्य तां राजा तन्निष्ठान्वेष्यकोऽभवत् ॥ ८६ ॥
 कमात्तं स सम्प्राप्य दैरो यक्षदरामिष्ये ।
 अञ्जलिभ्यां निचिक्षेप वीनारात् सलिलान्तरे ॥ ८७ ॥
 यत्र तीरद्यालम्बिशैलनिर्दुष्टिताः शिलाः ।
 चकुर्वितत्ता निर्णीडव एषः प्रतिपदोमुखम् ॥ ८८ ॥
 दुर्भिक्षोपहता प्राप्या वीनारात्वेपिणस्तदा ।
 शिलाः प्रवाहादुकृत्य वितस्ता समशोधयन् ॥ ८९ ॥
 एवं दिनानि द्वित्राणि पयो युजया निरुप्य तत् ।
 वितस्तोमकतः स्थानात् कर्मद्विरवन्धयत् ॥ ९० ॥
 पापाणसेतुवन्धेन प्रयोनाऽकुतर्क्षण्ण ।
 सप्ताहगमवद्वदा निखिला नीलज्ञा सरित् ॥ ९१ ॥
 अथः प्रवाहं संशोष्य दुठदशप्रतिक्रियाम् ।
 छत्वा चक्षैः शिलावन्धैः सेतुवन्धमगाटयत् ॥ ९२ ॥
 चिरखलनिरोधेन सोलकण्ठेवाऽम्बुद्धि प्रति ।
 ततः प्राप्तर्तत जवाद् गन्तु सामग्रामिनी ॥ ९३ ॥
 जम्बाल्याङ्का रस्तरमीना भूर्गी सलिलोजिता ।
 व्यवाहार्या सनशत्रा निर्मितेव नभस्त्रभवी ॥ ९४ ॥
 यत्र यत्र विवेदीपवेदं सलिलविग्रहे ।
 तत्र तत्र विवातायाः प्रवाहाध्रुतनान् व्यधात् ॥ ९५ ॥
 गूलसोतोऽग्निनिष्ठृत्याग्निरस्त्रोता वर्गी सरित् ।
 एकगोमाध्ययामेकपालेवसितपासगी ॥ ९६ ॥

4. Extract from *Rājatarangini* by Kalhan (Tremors in Srinagar, 1123 AD).

अतपत्तरगिस्तीक्षणमभीक्षणं भूरकम्पत । त्रुद्धुमाद्रीन्भञ्जन्तो महोत्पातप्रभञ्जनाः ॥११६७॥
पत्रनोत्थापितैः पांसुकूटैर्द्वे मदोद्दतैः । व्योम्बि प्रोत्तमनस्तम्भमद्विर्मिधातदारिते ॥११६८॥

5. Extract from *Tarikh-e-Hasan* by Pir Hasan Shah (An earthquake in Srinagar, 24th September 1501 AD).

در ایام حکومت سلطان فتح شاه ۹۰۷ هـ ۱۲ ماه ۱ سوچ ہاسی از شب
کذشته زلزله عظیم واقع شده خلق خدا بسیار ضایع کشت و خانه ها بیهار
رفت تا عرصه سه ماه زمین و زمان در ولوله بود انکاه بسیور قرار یافت ۔

(تاریخ حسن، بوق ۱۷۰ الف)

6. Extract from *Rājatarangini* of Śrīvara and Suka (A major earthquake in Srinagar and other places, September 1555 AD).

(B 418) दुग्धाचारादियं भूमित्रीयुक्तान्तेव भूरिदाः ।
त्रिदांडिन चाप्ययुक्तमासे कमिषता स्वामिनो मुहुः ॥१६॥

(B 419) आतेखाणागम्हा । दानाः मुक्तेन्द्रोव्रतिप्रहृष्टं ।
मोक्षातिथिसत्काराद् प्रहो धर्मेण दाम्यति ॥१७॥

(B 515) दित्ताये प्रहो रात्रेः प्रसुते सकले जने ।
दध्व्र धर्माकामाः मधितोनकमामयः ॥१८॥

(B 516) भूमिरङ्गेषु जातेषु भूवरपेन पदे पदे ।
पथि सचरतां मार्गं पान्यानां विस्तृताऽभयत् ॥१९॥

(B 517) भूमिरङ्गगते गेदे यत्रां निर्गमनाऽसुकाः ।
उपयोग्यादत्ते भित्ता जनाः प्रातिविनिर्ययुः ॥२०॥

(B 518) विकर्तानोयपतिताद् गृहात् काष्ठमयान्तदा ।
सप्तकांशेष्वतंतेषु प्रयुदा नियंयुजमाः ॥२१॥

(B 519) हर्षितुर्गोप्यागुरुयोर्वरतिनोः ।
नदीमुकुड्यप भूकम्पे व्युक्तमोऽयापि ददयते ॥२२॥

(B 520) કાચિડા તાનેતિ કાચિડપિ ચ હા માતરિતિ વા
 કાચિડા પિત્રેતિ કાચિડપિ ચ હા ભાતરિતિ વા ।
 તદા તત્ત્વાં કર્ણારદિતં દુર્ઘયસનિનાં
 નિશમ્યાભૂત વચ્ચેપ્રતિહતમિવાતીં હૃદયમ् ॥ ૨૦ ॥

(B 521) નિર્ધારતખાનાંપિને નમસિ હતગતી તારકાણાં સમૃદ્ધે
 કાદ્યોલાલોલતુર્વાંફલયદધિરતે ચક્રલે ભૂમિખણ્ણે ।
 પુત્રે પિત્રે કલત્રે સુગનસહૃદ્યે દ્રવ્યજાતે જનનાં
 ભૂર્ભાપાતકુંગદ્વાપચલિતમનસાં સ્નેહ ગાસાન્ત્રતેપામ् ॥ ૨૧ ॥

(B 522) વિજ્યેદ્વારાતાંબદ્રાદભેદવારાસિનામ् ।
 પુષ્પાંધીપ્રમાણેન ભૂર્ભાપાત્રાવદ્રયમ् ॥ ૨૨ ॥

(B 523) પુનઃપુનઃ પ્રતિદિન ભૂર્ભાપણે પ્રચરિતે ।
 ઉયાસ સફાં લોકઃ પટમણાપદાચિપુ ॥ ૨૩ ॥

7. Extract from *Tabaqat-e-Akbari* by Nizamuddin Ahmad (A major earthquake in Srinagar and other places, September, 1555 AD).

”منه لન્ની ઓ સ્ત્રીની ઓ તસુમાની દરીન સાલ એ જલ્દે ફ્લેમ દ્ર કશ્મીર હેડા શેડે
 એક્ર ફ્રીયાની ઓ રીલાર ખ્રાબ શેડે, ક્રીબે હ્લોડ દામ હોર બા ઉચારાની એનીન
 કાર બેન્ટ એસ્ટ્યુનાલ ન્યુન્ડે બાન ક્નાર ઝાહર ક્ષેન્ડે ઓ દ્ર મ્યુન્ચ માર દ્ર કે દ્રીયાની
 કો, ઓચુ સ્ટ બ્રોસ્ટે એન્ટાન્ડ કો મ્ર્ડમ અંગા મ્યુન્દાર શ્મેત હેઝાર કન હ્લ્યાક ક્ષેન્ડે!“

(ટ્યેક્ટે એક્બરી ‘જ દ્વીમ’ ચ 622)

8. Extract from *Tarikh-e-Ferishta* by Ferishta Muhamad Qasim Hindu Shah Astarabadi. (A major earthquake in Srinagar and other places, September 1555 AD).

"در سنه انتي و ستيين و تسعينه زلزله عظيم در کشمیر بيدا شده اکثر قريات و هلاك خراب کشت چنانکه قريه نيلو و آدم بور با عمارات و اشجار ازین طرف کثار آب بهت انتقال نموده بانطرف کثار آب ظاهر گردید و در موضع مادر که دریاى کوه واقع است بواسطه افتادن کوه مردم آنجا قریب

ششمد کن هلاک شدند -"

(تاریخ فرشته، ج دویم، ص 359)

9. Extract from *Tarikh-e Kashmir* by Haider Malik Chadura Raisul Mulk. (A major earthquake in Srinagar and other places, September 1555 AD).

"در ایام دولت او زلزله عجیب و غریب واقع شد که باد از زلزله قیامت میداد از انجمله عجایی که دران زلزله بظهور آند آنکه اکثر فانها در زمین فرو رفته است که اهل آن فانها از روزنه که بر بام خانه‌ای کشمیر متفاوت بیرون آندند و بعد از هر طرف شدن زلزله اسماه فانها همان راه بدرمی آوردند و از آنجمله است که میکنند العددی علی الراوى که در دو طرف نهر شهر واقع است و در صهه سراج بایان موضع بداره نزدیک شدی مرک قريه حسن بور و حسین بور این هر دو موضع در نیم شب زمین معمور باخانها و غیره حسن بور بجای حسین بور با بجانب شهر رفته و حسن بور باین طرف آب بجای حسین بور آمد که بعد آن ده باین جانب مکنه' این ده در انجانب سکنه' این ده راعت میکنند آنکه که ازان زلزله در ملک کشمیر مساوی این واقعات که بتفصیل نوشتند شود حمل بر مبالغات خواهند کرد - و این روز امتداد پافت -" (تاریخ کشمیر، فصل 158 الف ب)

10. Extract from *Tarikh-e Kashmir* by Narayan Kaul Ajiz. (A major earthquake in Srinagar and other places, September 1555 AD).

دران ایام زلزله عظیم غریب که باد از زلزله قیامت میداد واقع شد در آن زلزله که هفت روز امتداد داشت اکثر بیوت راسخ الدارکان متخف گردید غریب نقلیه میکنند اکرچه بقياس در نی آید چون از نقاب بکراپ شنیده چشم از مبالغه پوشیده در تحریر آن پادرت می نماید هر چند استبعاد دارد لیکن از قدرت او سبحانه تعالی چه مستبعد العبره علی الروات نقل است که دو روستان بست مراج پایان قصبه بحراره متصل نندی مرگ بر کثار نهر و یشونکی آن طرف نهر و یکی اسطرف نهر که تا امروز مزروع و معمور واقع است نام یکی حسن پوره و نام دیگری حمین پوره بسبب القاع زلزله خانه‌ای حسن پوره این طرف نهر آمده و خانه‌ای حسین پوره آن جانب نهر رفته تا اکون بر ملک قدیم مستعمر و معمول است که دهاقین ان روستاق پایان سمت آب و مزارع ان این قریه بانطرف نهر زیارت داردند ^۱

(تاریخ کشمیر، در ۷۵ ب ۷۶ الف)

11. Extract from *Waqiat-e Kashmir* by Khwaja Muhammad Azam Deedamari. (A major earthquake in Kashmir and other places, September 1555 AD).

نیز بوقوع آمده است قصه غریب است که بحسب تقدیر خالق کبیر دران هنگام در شهر کشمیر واقع شده یعنی مردم بزلزله عظیم شدیده با مسترار بیتلای شده اند کو پا زلزله قیامت بود عمارت مردم با مردم در زیر زمین فرو رفته لقل قلیلی از راه روز نه مفر می نیمی یا لغتند تا هفتنه این رایره سهله بود و ولقات غریبه ظاهر نبود از انجمله میکنند در پرگه مراج پایان موضع بمحیاوه نزدیک نندی مرگ حسن پوره و حسین پوره نام دو موضع در دو صرف بیلت مقابل یکدیگر بودند نیم شیعی زمین سعوره هر دو نه فرو رفته بجا ای حسن پوره حسین پوره شد و در مکان حسین پوره حسنه پوره نسودار شد - چنانچه هنوز کیفیت تهدیل نزلعت دال بین احوال است و تالیم درین مورد انجا این نقل شهرت ^۲

(واقعات کشمیر، در ۹۴ ب ۹۶ الف)

12. Extract from *Tarikh-e Hasan* by Pir Hasan Shah, major earthquake in Srinagar and other places, September 1555 AD).

ساتھے چہارم در وقت اسے اعمال شاہ سنه 996ھ زلزلہ سخت واقع کشت گواہ
 زلزلہ قیامت بود عمارت مردم با مردم در زمین فرو رفت و خانہ‌ها با خاک
 پکسان کشت سطح زمین را شکافتہ‌ای وسیع ظاهر شد و بخضی سرچشہ‌های
 قدیم فائیب کشته سر نو چشمہ‌ها جوشید نا عرصہ پک هفتہ پک زلزلہ در
 جنبش بود و تا دو ماہ زمین قرار کرفت حالات عجیبہ روی دار میگویند در
 پرکنہ آڑوں متصل نندہ مرگ حسن پورہ و حسین پورہ نام دو موضع بر کنارہ
 دریای ویشو مقابل یکدیگر بساخت پک میل بودند نیم شہی زمین معورہ هر
 دو ده متغیر کشته بجای حسین پورہ حسن پورہ رسیده و بمقام حسن پورہ
 حسین پورہ پدیدار شد چنانچہ الحال زمین زرعی حسین پورہ بطرف حسن پورہ
 است و اراضی و باشندگان حسن پورہ بجانب حسین پورہ واقع میان هر دو
 دریای ویشو میکرد این سخن ضرب المثل اهل کشمیر است و در پرکنہ کامراج
 ضلع مارو کوہ پارہ^۱ فلطیده مشهد کن ہلاک ساخت یہ

(تاریخ حسن، وق ۱۷۰ الف ب)

13. Extract from *Rājatarāṅgini* of Śrīvara and Suka. (An earthquake in Srinagar, 1560-61 AD)

(B 540) भृत्य विगदाहभूकम्पान् समीद्य वृथिवीभृता ।
 पृष्ठा धाक्यमिदं प्रादुर्गणका गणनापराः ॥ ४० ॥

14. Extract from *Rajatarangini* or *Srīvara* and *Suka* (an earthquake in Srinagar during 1569-77 AD)

(B 609) उत्पातलक्षणोपेता अकम्पे च यसुन्धरा ।
कुमिक्षमारोद्धनादसमर्थं च साभवत् ॥१०९॥

15. Extract from *Masir-e Alamgiri* by Muhammad Mustaid Khan. (An earthquake in Srinagar 23rd June, 1669 AD).

سال دوازدهم سنه 1080ھ
از واقعه کشمیر معروف گردید سیّم صفر زلزله از شام تا صبح ماند عمارت
کهواره وار در تزلزل بود اما آسیبی نرسید -
(ماشر عالمگیری، ص 87)

16. Extract from *Tarikh-e Hasan* by Pir Hasan Shah. (An earthquake in Srinagar, 23rd June 1669 AD)

در عهد حکومت سیف خان سنه 1080ھ ۳ ماه صفر زلزله رویداد از شام
تا صبح تمامی عمارت بدستور کهواره در تزلزل و حرکت بود لیکن چندان
نگرانی جان نرسید - (تاریخ حسن، ورق ۱۷۰ الف)

17. Extract from *Tarikh-e Hasan* by Pir Hasan Shah (A severe earthquake in Srinagar 1678-79 AD)

"در ایام صاحب صهی کی لہراہیم خان اولاً سلیمان طفیان نمود بعد آن
بحادثه" زلزله سخت خانهها بهار رفت و جانها بقضا بیوست مدتی مدد
بمد اوست زلزله احوال مردم در تزلزله بود مردمان زلزله خانهها جدلاکانه نیار
کرده بودند طفیان بهمد تاریخ است -"

(تاریخ حسن، اوراق 170 الف نیز ۱۷۲)

18. Extract from *Tarikh-e-Hasan* by Pir Hasan Shah (A destructive earthquake in Srinagar and neighbourhood, 24th March, 1736 AD).

"در زمان نیلپت دل دلیر خان سنه ۱۱۴۸هـ ۲۲ ماه ذی قعده زلزله عظیم
که نشان قیامت کبری بود ظهور نمود در شهر و روستاها بیک جنبش خانه ها
لغتاره بینیار هستی عالمی بهار رفت قریب سه ماه این زلزله در ولوله بود
اما مثل دفعه اول شدت نداشت و در شب و روز چند بار جنبش می نمود
بحدی که مرد مان مایوس از جان می شدند تاریخ این زلزله از آیه مکریه
لہلی المؤمنون و زلزلو از لزا لآ شدیداً اقتهاش کرده اند -"

(تاریخ حسن، ورق 170 ب)

19. Extract from *Tarikh-e Hasan* by Pir Hasan Shah (A severe earthquake in Srinagar and neighbouring villages, 1779 AD).

در ایام حکومت کریم دار خان سنه ۱۱۹۳هـ ساخت زمین همچنان بزرگ
که خانه های کثیر از شهر و بیک جنبش قلطا نهاد و از نوع بشر از سر
گذشت مدت پک نیم ماه سخت جانکاه بود و مردمان در صورا از زلزله
خانه ها ازراشتند بودند یـ

(تاریخ حسن، وق ۱۷۰ ب)

20. Extract from *Tarikh-e Hasan* by Pir Hasan Shah (A destructive earthquake in Srinagar, 1784-85 AD)

در عهد آزاد خان سنه ۱۱۹۹هـ بوقوع آمده در نفس شهر بیشتر زبر و نبر
نمود تا دو ماه متراکم بود خانه های بسیار و جانه های بیشمار ضایع
کشت یـ

(تاریخ حسن، وق ۱۷۰ ب)

21. Extract from *Ahom Buranji* (An earthquake at Garhgaon, 1548 AD)

61. In Lâkñi Tâo-Shingâ (i.e., in 1548 A.D.) a violent earth-quake took place. Pebbles, sand and ashes came out bursting the surface of the earth. In Lâkñi Kamut (i.e., in 1549 A.D.) the king fell ill in the capital. The Nagas of the village, Bânhâng attacked the Nagas of Baupha. The Nagas of Baupha being unable to hold their ground sent Kataki to the heavenly king with an offer of some methons, buffaloes and hunting dogs to request his help. The heavenly king, then, ordered Châo-Phuphirang (Burâgohâin) to march against the Nagas of Bânhâng. The king proceeded to the village, Bânrul. Châolângohâng was ordered to go to and remain in charge of Mahang. Châo-Phuphirang fought with the Nagas of Bânhâng and defeated them. He captured and brought with him the Naga Khunbâo, Châokingpung. He got twenty buffaloes, nine methons and a large coral bead as spoils of war and produced the Naga Khunbâo and the spoils before the king.

22. Extract from *Fathiya-e-Ibriya* by Shihabuddin Ahmad Bin Muhammad Wali Talish. (Mild earthquakes, Kajali, near Gauhati, 1663 AD)

درین منزل نوبتی آخر های روز بی آنکه ابر می درمیان آسمان و سحابی هرگز
لوق ظاهر باشد صدای سهیب ماند آواز رعد قوی از کوهستان بلند شد و بعد
از آن بی فاصله در زمین مسکر زلزله بشدت ظهور نمود که بی اختیار جالان
و قایم و متکی و نایم منحرک کشته اضطراب عظیم در خلائق به مر سیده و این
حالت نا نیم کهربالی مسند گردید سیزدهم رجب از کجی کوچ شده موضع
پاند و که مقلیل قصه گواهتی آن روی آب و لق شده محل نزول گشت -

23. Extract from *Muntakhab-ut Tawarikh* by Mulla Abdul Qadir Badaoni. (A destructive earthquake at Agra and in North-West India, 6th July, 1505 AD)

در سوم ماه صفر از سنه احدی عشر و تسعهایته (911) در جمیع هندوستان زلزله عظیم واقع شد چنانکه کوه ها به لرزه در آمد و عمارتهای عالی و مسیوی از هم ریخت و زمین جا بجا ترقیید و سوراخها پدید گشت و دیهای و درختان را میگزیند که جایهای خود را گذاشتند و مردم پندرا شتر مگر قیامت واقع شد و از واقعات بلیری و دیگر تواریخ چنان معلوم می شود که این زلزله مخصوص هندوستان نبود بلکه در هما روز در ولایت نیز این زلزله با این صفت واقع شد - و لفظ قاضی تاریخ آن یافتنند - یعنی

در نه صد و احدی عشر از زلزله * گردید سوار آگه چون مرحلهای
با آنکه نباهاش بسیعی عالی بوده * از زلزله شد عالیهای سفلهای
و از زمان آدم تا این زمان این طور زلزله نشانداره اند *

(منتخب التواریخ، ج اول - ص 319 - 20)

24. Extract from *Tabaqat-e Akbari* by Nizamuddin Ahmad. (A destructive earthquake at Agra and in North-West India, 6th July 1505 AD)

روز بکشنبه سوم ماه صفر سنه 10 احدی عشر تسعهایه در آگه زلزله عظیم شد چنانکه کوههای در لرزه آمد و عمارتهای عالی و سفیوط از هم ریخت زندهای قیامت پنهان شدند و مردهای حشر انکاشتند عه در نه صد و احدی عشر از زلزلهای - گردید سوار آگه چون مرحلهای - با آنکه نباهاش لبی عالی بود - از زلزله شده عالیهای سفلهای - از زمان آدم تا این زمان این طور زلزله در هند بوقوع نیامده است و هیچکس بار ندارد و گویند که در هما نرور در آگه بلاد هندوستان زلزله شده بود -

(طبقات اکبری، ص 165)

25. Extract from *Tarikh-e Khanjahani Makhzan-al Afghani* by Khwaja Nimatullah Harvi. (A destructive earthquake at Agra and in North-West India, 6th July 1505 AD)

”درین اتنا روز پکشنه سوم ماه صفر سنه ۹۱۱ احدی و عشر و تسعیه در آگه زلزله عظیم واقع شد - چنانچه کوهها و لرزو در آمدند و عمارت های از هم فرو ریختند و خلائق بسیار نلف ندند - زندها قیامت انکاشتند و مردها حشر پنداشتند و از زمان آدم تا حال این نوع زلزله در هندوستان بوقوع نیامد و اکثر مردم برانند که در همان روز در اکثر بلاد هندوستان زلزله شد -“

(تاریخ خان جهانی مغزن الفغانی، ص ۱۹۶-۱۹۷)

26. Extract from *Tarikh-e Daudi* by Abdullah (A destructive earthquake at Agra and in North-West India, 6th July, 1505 AD)

”درین حال بروز پکشنه سوم ماه صفر سنه ۹۱۱ احدی عشر و تسعیه در آگه زلزله عظیم واقع شد چنانچه کوه ها در لرزو آمد و عمارت های عالی باستحکام از هم ریخت زند ها قیامت پنداشتند و مردمها حشر انکاشتند چنانچه شاعری امیات چند در وقایع آن زلزله کفته یکی از این امیات این است که تحریر افتاده است

در نه صد واحدی عشر از زلزله ها * گردید سوار آگه چون مرحله ها از زمان آدم تا زمان سلطان سکدر این طور زلزله در هند بوقوع نیامده و هیچکس یاد ندارد ازان باز در هند زلزله قائم شده -“

(تاریخ داوودی، ص ۶۰ - ۶۱)

27. Extract from *Tarikh-e Ferishta* by Ferishta Muhammad Qasim Shah Astarabadi (A destructive earthquake at Agra and in North-West India, 6th July, 1505 AD).

"در سنه احدی عشر و تصعیمایته روز پکشنه سیم ماه صفر در آگه زلزله عظیم شد چنانکه کوههای هزاره در آمد عمارت عالیه محکم از هم ریخت بس زندها قیامت پنداشتند و مردمها حشر انگاشتند قطعه - در نهضه و احدی عشر از زلزله - گردید سوار آگه مرحله - با آنکه پنهانیش لبی عالی بود - از زلزله شد عالیهای ساقلهای - از این زمان تا این زمان این نوع زلزله در هند نشده و هیچکس پارندگار و نشان نی دهد و هم در این روز در اکثر هنار هند و سلطان زلزله شده بود ".

(تاریخ فرشته، ج' اول، ص 183)

28. Extract from *Basatin-us-Salatin* by Muhammad Ibrahim Zuberi (Severe tremors at Bijapur, 1653-54 AD)

"و در سنه هزار و شصت و چهار اب افضل ندا باهتمام افضل خان از بیگ خالاب قلعه در آمد در همین سال لرزه عظیم واقع شد و در همین سال ایلور فتح شد -" (بساتین الملاطین ص 346)

29. Extract from *Mirat-e Alam* by Bhakhtawar Khan. (An earthquake at Mandaran (West Bengal), 4th June, 1669 AD).

چهاردهم حرم سنه دوازدهم جلوس مطیع در نواحی قلعه مندران بشدت زلزله در قطعه زمینی شکلی که پنجاه ذرع طول و دوکز وضعنی بدید آمد و هرچند سکن آن چهار بیسانهای در از پان صد گزی و شصت و گزی را سنگ ها بسته در آن اندانخته سنگ بود بر زمین نه شست و عیق آن معلوم نشد - بس از چند روز بی سبب ظاهری آن شکاف فراهم آمده زمین یک لخت گردید -

(مراته عالم، ص 505)

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