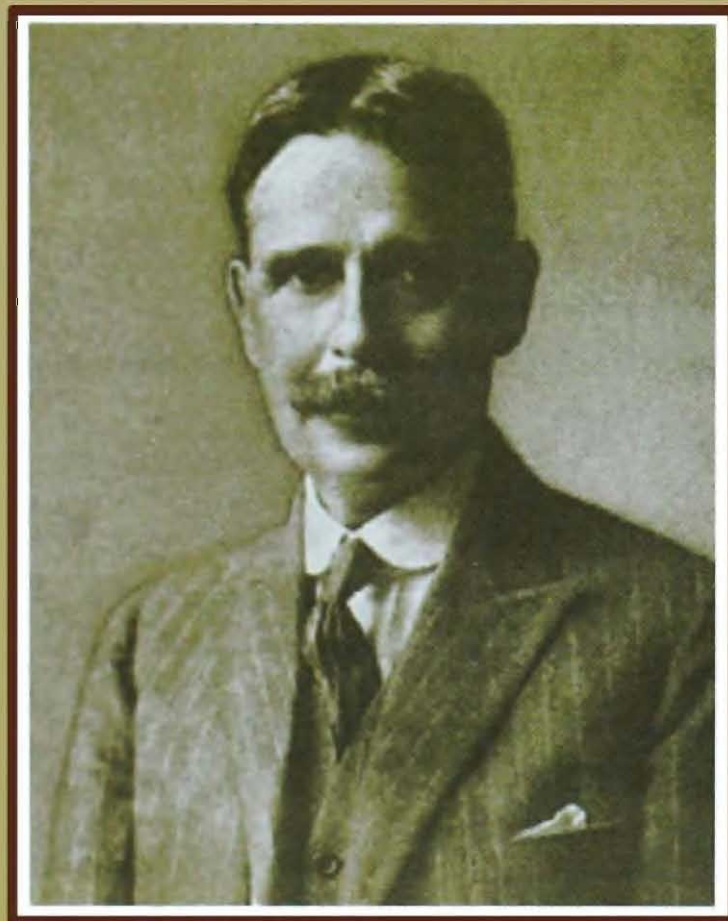




**Biography and Bibliography**  
*of*  
**Dr. Thomas Nelson Annandale**  
**(1876-1924)**



**ZOOLOGICAL SURVEY OF INDIA**

**BIOGRAPHY AND BIBLIOGRAPHY**  
***OF***  
**Dr. THOMAS NELSON ANNANDALE**  
**(1876-1924)**

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## PREFACE

**N**elson Annandale, more completely **Thomas Nelson Annandale** (1876–1924) for some strange reason does not feature in the academic curriculum of any Indian University teaching “Zoology” as a subject. The last of the English alphabet denoting the exciting area of Science inspired many brilliant minds over the centuries. But perhaps few can match the like of Nelson Annandale. Born in 15<sup>th</sup> June 1876, Nelson was the eldest son of Dr. Thomas Annandale, Professor of Clinical Surgery at the University of Edinburgh. His quest for knowledge was untiring in two major subject areas viz., Anthropology and Zoology. One can now relate the first and last letters of English alphabet, albeit logically—both dealing with life, past and present.

Nelson Annandale had his early education at Rugby where ‘his only recorded success appears to have been winning of a prize for an essay on the natural history subject’ From Rugby to Balliol College, Oxford, the passage was smooth; studying Zoology under Ray Lankester, Nelson graduated with honors in 1898. But while an undergraduate, Nelson had his restless mind exploring unknown. He visited Iceland and Faeroes Island on anthropological mission and even published a book ‘The Faeroes and Island: A study in Island Life’ (Clarendon Press, 1908). Right after graduation, he joined Skeat Expedition in 1899 to Malay Peninsula and again travelled to the area between 1901 and 1903. Nelson was then a Research Fellow in Anthropology (1902–1904) and his work ‘Fascicule Malayanees’—a series of papers finally earned him D. Sc., from the University of Edinburgh in 1905.

But eastern attraction was insurmountable. And Nelson joined Indian Museum, in the first ‘Capital City’ of British India, at Calcutta in 1904 as Deputy Superintendent; with retirement of Lt. Col. Alcock, Nelson Annandale succeeded him as Superintendent in 1907; with great energy and vision, he started two seminal series of publication ‘Record’ and ‘Memories’ of the Indian Museum.

But what is most unique is his liberal and humane outlook towards emerging Indian Science & Scientists. Not only did he recognise and applauded good works of Indian colleagues, but made it heard in the International scenario. Nelson strived to set up Zoological Survey of

India tirelessly between 1907 and 1915 and in 1916; the Zoological Survey of India was born. 'By this measure, Zoology was for the first time placed on a footing of equality with Geology and Botany and what had merely been the Zoological section of the Indian Media, become recognised as one of the great scientific research department of Imperial Government'

Annandale received many accolades during his rather life span of 48 years. He was President of Zoology & Entomology Section of Indian Science congress, Fellow of the Linnaean Society of London and in the year of his demise, his name featured in the list of recommended candidate to the Fellowship of the Royal Society. It's not his 'honors' and 'recognition' for which he should be remembered, but it's the work that he has left for the posterity, which need to be mentioned. Annandale's seminal work on Lake Biology, Cave Fauna, Study of Marine Biota and Estuarine Eco-system of *Hugli-Matla* to name a few, can never be bypassed without being referred to by any researcher. Royal Society (1925), mentioned 'Annandale was first and foremost a field naturalist or more precisely a student of animal ecology'

'Annandale was of slight physique, with a high strung temperament and restless energy' He was forth right in criticism and caustic wit, outspoken in expression, but brilliant in analysis. He was unsparing of assistance and encouragement to his junior assistants. 'Except for the Asiatic Society of Bengal, which owes to his wise counsel and of which he was President in 1923, Annandale's interest during his twenty years services in India were almost wholly concentrated in the institution that he culminated'

During his rather short space of life, Annandale a bachelor, travelled to Palestine in 1912 and 1921, revisited Malaya besides China and Japan in 1916 and Morocco in 1921.

One can never complete any homage to Annandale without referring to his unique Presidential Address delivered in the Section of Zoology in the Ninth Indian Science congress in 1922. His address was on 'Ethics of Zoology' One can not prevent the temptation of quoting Annandale, however selectively. Some excerpts

In his Introduction to the eighty-third section of the *Ain-i-Akbari* Shaik Abulfazal wrote of Akbar.

***“His majesty was taught men something new and practical and has made an excellent rule, which protects the animal, guards the stores, teaches equity, reveals the excellent and stimulates the lazy man.” (Blochmann’s Ain-i-Akbari, Vol. I, p. 217.)***

*“Let us constitute ourselves humble followers of Akbar and strive to find a rule that will at once protect the animal, guard and stores of zoological learning, maintain equity between zoologists and stimulate the excellent, if not the lazy man to sound zoological research.”*

While discussing the genesis of zoological research in India, Annandale said

*“Sir William Jones in his inaugural discourse to Asiatic Society, delivered in Calcutta in 1784, omitted zoology from the proposed agenda of the Society. Nine years later, in his tenth address he explained the reason. ‘Could the figure, instincts and qualities of birds, beasts, insects, reptiles and fishes,’ he said, ‘be ascertained, either on the plan of Buffon, or on that of Linnaeus, without giving pain to the objects of our examination, few studies would afford us more solid instruction or more exquisite delight’ ”*

Annandale was critical of this decision of Sir William Jones, as he observed

*“Elementary as was Sir William Jones’s concept of zoology, his opinion as a scholar and a poet cannot be dismissed lightly. There is, as the French say, nothing that kills like ridicule, but ridicule kills only when its object is really ridiculous. To laugh at what is true and solid is merely to exhibit lack of sympathy and sense.”*

*“The study of zoology in India has not, as a matter of practice, been much affected by the addicts of Asoka and the remarks of Sir William Jones on the supposed cruelty involved in zoology had no more than a temporary effect on the history of the Asiatic Society. Indeed, it seemed at times as if the stone the builder had rejected had become the headstone of the corner, for in the days of Blyth and again in those of Alcock, zoological papers were amongst the most important published in the Society’s Journal. Nevertheless, it is as well that in our zoological work we should keep in mind both Firdausi and Piyadasi.”*

Annandale in his inimitable way laid the future path of Zoological Survey of India, as he said

*“In the official document whereby the Zoological Survey of India was constituted in 1916, our relations with the technical departments are laid down as being those of ‘co-ordination without subordination’ .The thanks of all Indian zoologists are due to the man who discovered this formula – I do not know his name. The formula implies not only the recognition of pure zoology on the part of the Government of India, but also its independence of direct economic aims. I have nothing to say against applied science, provided that it is science at all, but the term is often ‘applied’ to something akin to the Holy Roman Empire, which has been described as neither holy, Roman, nor an empire.”*

He was forthright in criticizing the dogma of the western scientists towards the works of Indian Zoologists or the works carried out in India, when he mentioned

*“In discussion on the value of zoological works there is nothing that makes me more indignant than the saying that this or that piece of Indian research is good work – for India. This usually means that it is of inferior quality, but must not be judged too hardly, because it has been done either by an Indian or by an Englishman working amidst Indian difficulties. We Indian zoologists, to judge by the work of our predecessors – Hodgson, Blyth, Stoliczka, Blanford, Alcock and many others – have no reason to claim indulgence. There can be nothing more fatal to Indian science than to aim at a low ideal and no greater insult can be paid to any branch of scientific effort than to judge it from a racial or a geographical stand-point. Zoology is often regarded in India as the Cinderella of the sciences and it is, therefore, necessary on occasion for zoologists to mingle the meekness of the dove with the subtlety of the serpent.”*

He continued his strong advocacy on the necessity of carrying out zoological research in India, as he said

*“I had recently in London an opportunity of discussing the position of zoology in the country with one of the greatest of living zoologists. He maintained that zoology should not be encouraged in India, until India was in a position to do independent work. By independent work he meant research independent of official control. Apart from all personal considerations, I was unable to agree with him, for I see no way of fostering zoological research at present in India, but through the agency of government. It is quite true that no branch of science can be said to*

*be on a sound basis unless it is independent and that the flame of research must burn feebly so long as it is not fed by the sprit of individuality. Moreover, the age has not yet come in which the true value of the independence of science will be appreciated by the powers that be. Science and officialdom are as antagonistic as the mongoose and the snake, but officialdom in its dangerous form is a matter of the spirit: obiit in mores. To confound government with officialdom is unjust."*

Annandale was aware of bureaucracy what he termed officialdom and is immense adverse effects in pursuing free and fair pathway of research. He said

*"No government that consisted merely of officialdom could exist for a month. I prefer to regard red-tape as the excreta of government. It is unfair to judge any organism but its excreta, nor is it fair to confound the Imperial policy with the wriggling of some harassed secretary afflicted with dysentery of notes and minutes and trembling at the name of Finance Department. Zoology throughout the world owes a great debt to the government of India as the only Government that has founded a zoological survey on a basis of pure research. At the present time zoological posts sanctioned in previous years are kept vacant in Great Britain in the interests of so-called economy, while in India the Government is at any rate attempting to place zoological research on a sound financial basis. The constitution of the Indian Museum is now especially in the matter of zoology, much more liberal than that of the British Museum from which it was originally copied. We have, therefore, in India justification for the hope of a bright age. With faith in our calling and hope in its future we zoologists are in a very strong position."*

*"Science can afford to be magnanimous and the petty politics of the passing hour need not concern us. Truth is great and will prevail. Whatever may be our political views, whatever our race, or creed. or caste, Pope's words stand true in science":-*

*"For Forms of Government let fools contest;  
What're is best administrated is best;  
For Modes of Faith let graceless zealots fight;  
He can't be wrong whose life is in the right;  
In Faith and Hope the World will disagree;  
But all Mankind's concern is Charity."*

Annandale breath his last on 10<sup>th</sup> April, 1924, after only a few days of serious illness in this city of Calcutta (he was laid to rest in the South Park Street Cemetery, but later his last remains was removed to the Scottish Cemetery, in Ekka Lane, Park Circus, Kolkata).

Dr. S. Kemp, his distinguished colleague, wrote *“To most of his acquaintances... Annandale was something of an enigma ... only those who knew him intimately were aware of his kindly consideration for others and the readiness with which he gave assistance to all who needed it. By these qualities he endeared himself to his staff, inspiring the... He saw that each obtained full credit for all he did and was always ready to champion the cause of any member of his department when he thought his work had not received due recognition. His name will endure as an inspiration to his successors...”*

Annandale left a legacy behind. Not only his enormous publications covering 14 diverse areas of Zoological research besides Botany and Anthropology (including many in *‘Nature’* but also his foresight insisting the necessity of setting up ZSI. This survey continues to provide immense services to Agriculture, Fishery, Animal Husbandry, Public Health etc. over last 94 years. The Zoological Survey of India has survived test of time, grown from strength to strength, branching out from headquarters in Kolkata to 16 centres across India. But, hurdles and problems remain and perhaps only with resolute determination one can cope up with the hurdles.

It is not strange that **‘Annandale Memorial Medal’** was announced by the Council of Asiatic Society, in April 1924, to perpetrate the memory of Dr. Thomas Nelson Annandale, D. Sc., F.L.S., F.R.S., to be awarded triennially for **‘Anthropological Work in India’**

Annandale remains what he was. A complete man with knowledge extending from A to Z.

**Dr. A.K. Ghosh**

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Dr. A K Ghosh, Ph. D., served as the 13<sup>th</sup> Director of the Zoological Survey of India during 1992–1996. A Fulbright Scholar and recipient of several honors and Visitorship, Dr. Ghosh is currently the Director, Centre for Environment & Development, Kolkata and a visiting faculty to the University of Calcutta & Jadavpur University. He has published more than 330 research papers including 25 books from 10 countries around the world.

## **ESTABLISHMENT OF ZOOLOGICAL SURVEY OF INDIA**

Biodiversity underlies our existence and contributes to our physical and mental health and ensures that we remain in touch with the natural world. Equally true, no organism exists in isolation from other living organisms and individually each plant and animal has a role to play in the web of life around us. It is for this reason, that the global community expectations are reflected in understanding, and developing strategies, legislations and agreements at national and international level for best practices in all environmental matters.

Faunistic and floristic surveys provide information to address both biodiversity conservation and ecological function values of the country, based on qualitative and quantitative floristic and faunistic species composition, threatened species and the ecosystem that sustains, as well, identifying landscapes, biologically rich and valuable areas. It also serves to understand the intrinsic value of the species, not only based on the rarity and vulnerability in terms of geographic distribution, but also on the basis of the key functions. The survey also provides a basis and benchmark for ongoing species and habitat action plans to conserve and increase biodiversity.

The voucher specimens collected during various faunistic field surveys and explorations, preserved and deposited in natural history museums helps in recognising multiple species in a complex of closely related species, variation in traits of populations that affect morphology, ecology, behaviour or physiology, errors or omissions in keys or guides used for identification. Accessible voucher specimens are critical for accurate identification and subsequent verification of species. Species are the raw material of biodiversity research, whether the focus is of research in taxonomic, evolutionary, ecological, genetic, behavioural or physiological aspects. Research projects in biodiversity require a significant investment of time, effort and money, but without adequate documentation in the form of vouchers there is great potential for that investment to be wasted. Indeed, a failure to protect the currency of science inevitably leads, just as in business, to bankruptcy.

In a time when the world knows little over 1.75 million species, a large number is yet to be described especially from tropical countries, and even after 250 years of Linnaeus, we still to know the entire species diversity living on this universe.

### **Formative days (1700's-1916)**

Serious exploration of the faunal diversity of India was started during the last quarter of 18th century. The Asiatic Society of Bengal, founded by Sir William Jones in 1784 was only organisation documenting culture and biological wealth of the east during that time. The society possessed a building in 1808 and established a museum in 1814. Sir William Jones was personally not in favour of collecting zoological specimens; however there was definitely a bias towards biological specimens from the very beginning in the museum.

### **SIR WILLIAM JONES**

The phase of field studies was initiated by the British Government for the investigation of deep sea fauna, assigned to Surgeon Naturalists of the Marine Survey of India. The deep sea explorations started in 1822, with Royal Indian Marine Ship *Investigator*, laid a solid foundation for the systematic study of deep-sea fauna. Among the other earlier zoological explorer, the contributions made by Dr. John Anderson from his expeditions to Yunan (China) in 1868 and 1875, collections from Persian Boundary Commission (1870-1872), Second Yarkan Mission (1873-1874) and Dafla expedition (1874-1975) are significant in the history of the survey.

Many distinguished naturalists such as John McClelland, Edward Blyth, William Blanford, Henry Blanford, Theodore Cantor, Francis Day, H.H. Godwin-Austen, Thomas Hardwicke, Brian Hodgson, Geoffrey Nevill, Henry Nevill, Ferdinand Stoliczka, W.M. Sykes, William Theobald, S.R. Tickell, John Anderson and James Wood-Mason significantly contributed in documenting the fauna of Indian subcontinent in early years.

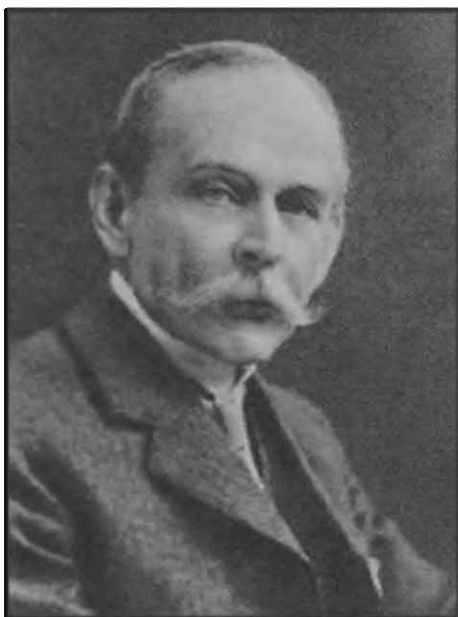


The Government of India passed The Indian Museum Act in 1866 and the museum of Asiatic Society was transferred in 1875 to the newly constructed building. By this time the zoological and anthropological collection had expanded, a number of descriptive catalogues were published and expeditions were taken out to different parts of the empire.

Sir Alfred Alcock, was working as superintendent of the museum. At the Indian Museum, Alcock worked on improving the public galleries of Reptiles, Fishes and Invertebrates. Sir George King who was the chairman of the Trustees supported him, however after his retirement, Alcock was given little support. Lord Curzon decided to exhibit the collections of the Indian Museum as a memorial to Queen Victoria in 1903 and Alcock was ordered to *“to vacate the gallery of Fishes at a moment’s notice.”*

### SIR ALFRED ALCOCK

Alcock protested to the Trustees that *“it would be disgraceful to dismantle a gallery of Invertebrates which included an exhibit of the recent mosquito-malaria discoveries, at a moment when those discoveries seemed at last to have driven into the thickest British skull the great truth that the study of zoology was of some use to mankind.”* The gallery was spared but the library was to be cleared. These experiences caused Alcock to quit and he returned home in 1906 writing to the Government *“telling him what an impossible post the superintendentship*



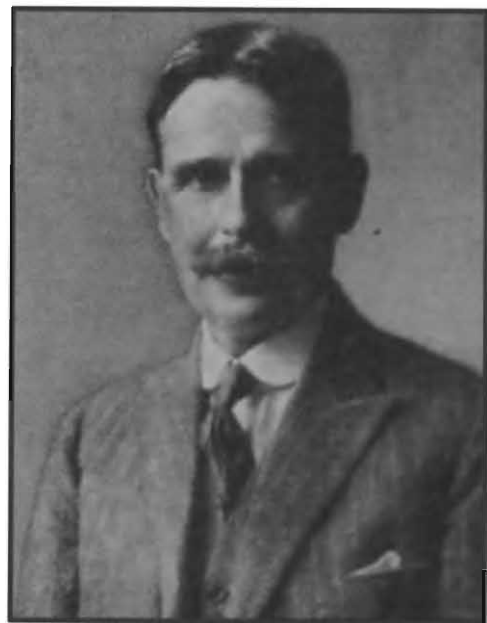
*of the Museum was and begging him to get it improved for the sake of the Science of Zoology and of my successors.”* In the letter Alcock wrote that Zoology was *“a branch of pure science pregnant with human interest”*, important to the state *“in matters of education, in matters agricultural and veterinary, and in the vital matter of public health”* He suggested the establishment of an *Indian Zoological Survey* with a museum and laboratory administered by zoologists along the lines of the Geological and

**Botanical Surveys (Wikipedia).**The main task of the Asiatic Society (1814-1875) and Indian Museum (1875-1916), was to identify and exhibit the zoological collections deposited by different explorers and naturalists of British India when organised field studies for fauna were limited. It was felt, that the role of survey was not purely of museum taxonomy and without having detailed field studies, any conclusion drawn regarding the habit and habitat of any species would be meaningless.

A representation made to the Government of India by the trustees of the Indian Museum accepted the advice and separated the Zoological and Anthropological section from the Indian Museum on 1st July, 1916 into a separate department, the Zoological Survey of India. The exploratory field studies gained considerable importance after the official creation of the Zoological Survey of India, as an independent organisation. The post of Surgeon Naturalists, Marine Survey of India was transferred to Zoological Survey of India in 1920 and Major R B Seymour Sewell became an additional member of the survey in the rank of Superintendent.

### **NELSON ANNANDALE (1916-1924)**

The Zoological Survey of India (ZSI) commenced its work with four scientific officers under the directorship of Dr. Thomas Nelson Annandale. The first survey was undertaken at the request of the medical authorities of India. During First World War, the government became anxious that the disease Schistosomiasis, hitherto unknown in India, might be introduced by soldiers returning from Middle East. A survey of Indian freshwater Mollusca and their possible role in acting as vectors of human Schistosomiasis was under taken. Other significant contribution from Dr Nelson Annandale include expedition to Lake Galilee, Tiberas, Palestine, to the Tale Sap in Thailand and to Lake Biwa in Japan.



## Biography

Dr. Thomas Nelson Annandale was born on 15th June 1876 at Edinburgh city of United Kingdom. He came to India in 1904 as Dy. Superintendent of the Natural History Section of the Indian Museum and in 1907 was appointed as Superintendent on the post vacated by Lieut-Col. Alcock. Under his strong and wise administrative ability, the Natural History Section of the Indian Museum flourished both with human and faunal resources. Two scientific journals viz., *Records of the Indian Museum* and *Memoirs of the Indian Museum* was initiated and inaugurated in the year 1907. Dr. Annandale was Honorary Secretary to the Board of Trustees of the Indian Museum for many years. In 1916 he achieved one of his principal aims in the foundation of the Zoological Survey of India, in which he was appointed as Director and performed his duty till his last breath.

He had published a series of scientific reports on zoology as well as on anthropology. In spite of his pre-occupied administrative work, he became an authority on many groups of animals like sponges, polyzoa, barnacles, molluscs *etc.*, but his interest spread far beyond these limits and there is scarcely any group in the animal kingdom on which he did not make original contributions. Thus, Dr. Annandale became a legend in his life time.

He was an emphatic believer in the necessity of field work. He travelled all corners of the Indian Empire and acquired a personal knowledge of its fauna. Prior to beginning of his career in India, he had travelled widely, which includes Faroes and Iceland, Skeat Expedition to the Malay Peninsula in 1899 and subsequently revisited the country during 1901 to 1903 and the results were published in three volumes under the title *Fasciculi Malayenses*. In the years 1912 and 1921 he visited Palestine and in 1916 he undertook a comprehensive journey to the Malay States, China and Japan and in 1921 the Morocco. Before arrival in India, his chief interest was in Anthropology, but the same was overshadowed by his later activities in zoology, where he continued to make contributions throughout his life. His suggestion on the problem in anthropology to P.C. Mahalanobis led the latter discovery of a technique that developed into the multivariate statistical techniques of today.

## Scientific Evaluation

It is almost an impossible task to evaluate the scientific work of Dr. Thomas Nelson Annandale, who had studied and published a lot almost on every group of zoology. Within a very short life span of only 48 years he produced an enormous number of publications in almost all groups of zoology and anthropology also. Altogether he published 538 scientific reports and findings including 72 articles on anthropology and only 1 on Botany. The anthropological articles are mostly based on the expedition in Malay Peninsula. In the beginning of the 20<sup>th</sup> century he published certain anthropological reports on Scotland and Iceland.

Dr. Annandale started his career as an anthropologist and for that he mainly concerned himself as a member of the Skeat Expedition, with Mr. H.C. Robinson. Later the result was published under the title *Fasciculi Malayenses*. He also wrote on pure ethnography, physical anthropology, folklore, religion including original anthropological observations. Though, later his main interest was in zoology yet he continued his interest in anthropology and published articles in the *Memoirs and Journals of the Asiatic Society of Bengal*. He engaged himself to obtain data from the Eurasian population of Kolkata for anthropometrical study. He edited a special centenary volume, entitled 'The Indian Museum: 1814-1914' and contributed a chapter in it.

He started working on the aquatic fauna of India, an untouched field of research and gave much of his attention to the fauna of freshwater and began a series of study on *Hydra* as well as freshwater sponges and Polyzoa, which he summarized in 1911 and published in 'The Fauna of British India and Ceylon' During the last eight years of his life he published an enormous volume of work on fresh and brackish water mollusca. His study on the faunas of the Asiatic Lakes is still an invaluable document. He personally investigated the fauna of nine lakes spread throughout the length of Asia, viz., Sea of Galilee, the Hamuni-Helmand in Siestan, the Chilka Lake in Orissa, the Ennur backwater near Madras presently Chennai, the Loktak Lake in Manipur, The Inlé Lake in Mayanmar, the Talé Sap in the Siamese Malay States, the Taihu in China and Lake Biwa in Japan and published enormous scientific documents, however his intention to correlate all his observations had not come true due to his untimely death.

He extended his work on sponges to the marine family Clionidae and became an authority on the pedunculate Cirripedes. In 1911 he recorded the occurrence of *Limnognathia* in Indian waters, a freshwater medusa, and in 1912 described *Caridinicola*, a Temnocephalid parasite of Atyid prawn. In 1910-1911 he published an important revision on Sand-flies of the genus *Phlebotomus*. Before his death, he rented a bungalow in the Barkuda Island of Chilka Lake and at the time of his death, a series of papers on the fauna of the Barkuda Island was sent for publication. One of the most valuable contributions being a detailed account of the habits of termites.

From a close study of fossil mollusca he was able to formulate a theory of parallelism or convergence in the evolution of the shell-sculpture of the Viviparidae. He also drew attention to a similar phenomenon in the adaptations undergone by fish and tadpoles inhabiting mountain torrents. He worked out on the freshwater sponges of the United States National Museum collected by Prof. Max Weber from South Africa and reported to the Imperial Academy of St. Petersburg on the sponge-fauna of Lake Baikal. He examined the Cirripeds obtained during the Ceylon Pearl Oyster Investigation; the pedunculate forms obtained by the Danish Expedition to the Gulf of Siam and made a valuable contribution to our knowledge of this group in his account of a collection obtained from telegraph cables in the Malay Archipelago. In the American journal of Hygiene he wrote on the molluscan hosts of the human blood fluke in China and Japan. He reported mollusca of the Percy Sladen Trust Expedition to Yunnan and on Polyzoa from the Volga Basin and the Colombo water works. He also contributed a paper on the marine element in the fauna of the River Ganges.

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17. Annandale, N. 1905. Notes on an Indian Worm of the Genus *Chaetogaster*. *J. Asiat. Soc. Bengal* (n.s.), 1 117-120, pl. iii.

*Chaetogaster bengalensis* sp. nov. in ponds in Calcutta, description, figures, habits and symbiosis.

18. Annandale, N. 1905. Additions to the collection of Oriental Snakes in the Indian Museum. Part 2. Specimens from the Andamans and Nicobars. *J. Asiat. Soc. Bengal* (n.s.), 1 173-176.

Following species of snakes are described :

Family TYPHLOPIDAE

*Typhlops braminus* (Daud.)

Family COLUBRIDAE

*Lycodon aulicus* (Linn.)

*Oligodon woodmasoni* (Scl.)

*Coluber melanurus* Schleg.

*Dendrophis pictus* (Gmel.)

*Tropidonotus piscator* (Schneider)

*Tropidonotus nicobarensis* Scl.

*Dipsadomorphus ceylonensis* Gthr.

*Distira andamanica* sp. nov.

19. Annandale, N. 1905. Additions to the collection of Oriental snakes in the Indian Museum, Part 3. *J. Asiat. Soc. Beng.* (n.s.), 1 208-214.

Family TYPHLOPIDAE

*Typhlops mulleri*

*Typhlops kapaladua* sp. nov.

*Typhlops acutus*

Family GLAUCONIIDAE

*Glauconia blanfordii*

Family COLUBRIDAE

*Calamaria leucocephalia*

*Dryocalamus tristrigatus*

*Tropidonotus khasiensis*

*Macropisthodon Himalayanus*

*Coluber radiatus*

*Ablabes gilgiticus*

*Ablabes baliodirus*

***Helicops indicus* sp. nov.**

***Dipsadoides decipiens* genus & sp. nov.**

*Bungarus sindanus* Blgr.

20. Annandale, N. 1905. Notes on the species, external characters and habits of the Dugong. *J. Asiat. Soc. Bengal* (n.s.), 1 238-243, pls. vii-ix.

SIRENIA

*Halicore Dugong* – morphology, habits and etc.

21. Annandale, N. 1905. Contributions to Oriental herpetology II. Notes on the Oriental lizards in the Indian Museum, with a list of the species recorded from British India and Ceylon. Part 1. *Proc. Asiat. Soc. Beng.*, 1 81-93.

Following species are described and also a list of lizards of India, Burma and Ceylon is incorporated.

Family GECKONIDAE

*Hemidactylus triedrus* Dud.

*Hemidactylus karenorum* (Theob.)

*Hemidactylus frenatus* Gray

*Hemidactylus platyurus* (Schneider)

*Ptychozoon homacephalum* (Crev.)

*Phyllodactylus burmanicus* Annandal

*Gonatodes andersonii* Annandale

***Gymnodactylus consobrinoides* sp. nov.**

*Gymnodactylus oldhami* Theob.

*Gymnodactylus marmoratus* Gray

*Gymnodactylus feae* Blgr.

*Alsophylux pipiens* (Pall.)  
*Lepidodactylus ceylonensis* Blgr.  
 Family EUBLEPHARIDAE  
*Eublepharis hardwickii* Gray  
 Family AGAMIDAE  
***Calotes junnanensis* sp. nov.**  
*Calotes microlepis* Blgr.  
*Calotes versicolor* (Daud.)  
*Calotes rouxii* Dendy & Burton  
***Japalura andersonia* sp.nov.**  
*Pycitolaemus gularis* Ptrs.  
*Acanthosaura lamnidentata* Blgr.  
*Solia horsfieldii* Gray  
*Agama lirata* (Blanf.)  
*Agama nupa* De Fil.  
*Liolepis bellii* (Gray)  
 Family ANGUIDAE  
*Ophisaurus apus* (Pall.)  
*Ophisaurus gracilis* (Gray)  
 Family VARANIDAE  
*Varanus dumerilii* (Mull.)

22. Annandale, N. 1905. Contributions to Oriental herpetology III. Notes on the Oriental lizards in the Indian Museum, with a list of the species recorded from British India and Ceylon. Part 2. *Proc. Asiat. Soc. Beng.* (n.s.), 1 139-151.

Following species are described and also a list of lizards of India, Burma and Ceylon is incorporated.

Family LACERTIDAE  
*Tachydromus septentrionalis* Gthr.  
*Lacerta viridis* (Laur.)  
*Ophiops schleuteri* Boett.  
 Family SCINCIDAE  
*Mabuia rugifera* (Stol.)  
*Mabuia multifasciata* (Kuhl.)  
*Mabuia tytleri* Blgr.  
*Mabuia monticola* (Theob.)

*Mabuia anakular* nom. nov.  
*Lygosoma maculatum* (Blyth)  
*Lygosoma mitanense* sp. nov.  
*Lygosoma dussumerii* var. *concolor* var. Nov.  
*Lygosoma olivaceum* var. *griseum* (Gray)  
*Lygosoma cacharensis* sp. nov.  
*Lygosoma pulchellum* (Gray)  
*Lygosoma sikkimensis* (Blyth)  
*Lygosoma tragbulense* Alc.  
*Lygosoma beddomii* Blgr.  
*Lygosoma formosum* (Blyth)  
*Lygosoma atrocostatum* (Gray)  
*Lygosoma chinense* (Gray)  
*Lygosoma lineolatum* (Stol.)  
*Lygosoma comottii* Blgr.  
*Lygosoma anguinum* (Theob.)  
*Eumeces scutatus* (Theob.)  
*Eumeces taeniolatus* (Blyth)  
*Scincus mitranus* Anders.  
*Chalcides ocellatus* (Forsk.)

23. Annandale, N. 1905. On abnormal Ranid larvae from North-Eastern India. *Proc. Zool. Soc. London* 58-61.

Two tadpole larva of *Rana* from northern Cachan in Assam studied and described, which are of the same species and abnormal in the absence of hind limbs. These are present in the miscellaneous specimens present in the Indian Museum.

24. Annandale, N. 1905. The egg and early larval stages of a Coreid Bug, probably *Daladar acuticosta* Amyot et Serv., with a note on its Hymenopterous parasite. *Trans. Entom. Soc. London* 55-60, pl. viii.

Detail description of the egg and early larval stage of the Heteroptera was given but species was not confirmed and written as "almost certainly *Dalader acuticosta*"

25. Annandale, N. 1905. Notes on some Oriental Geckos in the Indian Museum, Calcutta, with descriptions of new forms. *Ann. Mag. Nat. Hist.*, (7)15 26-32.

***Hemidactylus subtriedroides* sp. nov.**  
*Hemidactylus garnotii* Dendy & Burton  
***Ptychozoon homacephalum lionotum* var. nov.**  
*Phyllodactylus siamenses* Boulenger  
***Phyllodactylus burmanicus* sp. Nov.**  
*Gonatodes marmoratus* Beddard  
*Gonatodes affinis* Stol.  
*Gymnodactylus fedtschenkoi* Strauch.

26. Annandale, N. 1905. Malaysian Barnacles in the Indian Museum, with a list of the Indian Pedunculata. *Mem. As. Soc. Beng.*, 1 73-83.

Stalked Barnacles from western Malaysia :

*Poecilasma amygdalum*  
*Dichelaspis equina*  
*Alepas indica*  
***Alepas malaysiana* sp.nov.**  
***Alepas gigas* sp.nov.**  
*Scalpellum inerme*  
***Scalpellum sociabile* sp.nov.**  
***Scalpellum inerme* sp.nov.**

Stalked Barnacles from the Indian Seas :

*Scalpellum gruvelii*  
*Scalpellum gruvelii* var. *quadratum*  
*Scalpellum laccadivcum*  
*Scalpellum laccadivcum* var. *investigatoris*  
*Scalpellum alcockianum*  
*Scalpellum squamuliferum*  
*Scalpellum bengalense*  
*Scalpellum acutum*  
*Scalpellum velutinum*  
*Scalpellum wood-masoni*  
*Scalpellum tenue*  
*Scalpellum novae-zelandiae*  
*Scalpellum subflavum*  
*Megalasma striatum*  
*Megalasma carino-dentatum*

*Poecilasma kempferi*  
*Poecilasma amygdalum*  
*Dichelaspis pellucida*  
*Dichelaspis lepadiformis*  
*Dichelaspis grayi*  
*Dichelaspis warwicki*  
*Dichelaspis equine*  
*Conchoderma hunteri*  
*Alepas xenophorae*  
*Alepas indica*  
*Lithotrya dorsalis* var. *maldivensis*  
*Lithotrya dorsalis* var. *rugata*  
*Lithotrya nicobarica*

27. Annandale, N. 1906. Notes on the freshwater fauna of India. 1. A variety of *Spongilla lacustris* from brackish water of Bengal. *J. Asiat. Soc. Beng.*, 2 55-58.

Described a new variety of freshwater sponge and included a list of freshwater sponges recorded from India.

Phylum PORIFERA

***Spongilla lacustris* var. *bengalensis* nov.**

28. Annandale, N. 1906. Notes on the freshwater fauna of India, No. II.—The affinities of *Hislopi*a. *J. Asiat. Soc. Bengal* (n.s.). 2 59-63.

Described the polyzoa *Hislopi*a *lacustris* from Calcutta 'Maidan' and compared with *Norodonia* of Carter.

29. Annandale, N. 1906. *Testudo baluchiorum*, a new species. *J. Asiat. Soc. Bengal* (n.s.), 2 75-76.

***Testudo baluchiorum* sp. nov.**

30. Annandale, N. 1906. Notes on the freshwater fauna of India, No. III. – An Indian aquatic cockroach and beetle larva. *J. Asiat. Soc. Bengal* (n.s.). 2 105-107.

Aquatic habits of cockroaches of two species of genus *Epilampra*.

31. Annandale, N. 1906. Notes on the freshwater fauna of India, No. IV.- *Hydra orientalis* and its bionomical relations with other invertebrates. *J. Asiat. Soc. Bengal* (n.s.), 2 109-116.

*Hydra orientalis* lives commensal life with freshwater sponges and polyzoa. Chironomid larvas are the enemies which feeds on *Hydra orientalis*.

32. Annandale, N. 1906. Notes on the freshwater fauna of India. V. Some animals found with *Spongilla carteri* in Calcutta. *J. Asiat. Soc. Beng.*, 2 187-196.

Aquatic worm *Chaetogaster spongillae* sp. nov., Chironomid larva *Tanytus* sp. and Neuropterous larva *Sysyra* sp. occur in the substance of living specimens of *Spongilla carteri* in Calcutta, while several other animals seek shelter in the dead skeleton of the sponge.

33. Annandale, N. 1906. Notes on the freshwater fauna of India, No. VII. A new Goby from fresh and brackish water in lower Bengal. *J. Asiat. Soc. Bengal* (n.s.), 2 201-202.

New species of Gobid fish from Port Canning (lower Bengal.).

*Gobius alcockii* sp. nov.

34. Annandale, N. 1906. Contributions to Oriental herpetology. No. 4. Notes on the Indian tortoises. *J. Asiat. Soc. Bengal* (n.s.), 2 203-206, pl.2.

Described the following species and appended a list of the Indian Tortoise.

Family TRIONYCHIDAE

*Trionyx gangeticus* Cuvier

*Emyda granosa* (Schoepff)

Family TESTUDINIDAE

*Testudo elegans* (Schoepff)

*Testudo horsfieldii* Gray

*Testudo baluchiorum* Annandale

*Nicoria trijuga* (Schweigg.)

*Bellia petersii* Annandale

35. Annandale, N. 1906. Note on a rare Indo-Pacific barnacle. *Jour. & Proc. Asiatic Soc. Bengal* (n.s.), 2 207-208.

Compared three species

*Conchoderma hunteri*

*Conchoderma virgatum* (Spengler)

*Conchoderma virgatum* var. *hunteri*

36. Annandale, Nelson, 1906. A new gecko from the Eastern Himalayas. *Journ. & Proc. Asiatic Soc. Bengal*. N.S., 2 287-288.

Family GECKONIDAE

*Gymnodactylus himalayicus* sp. Nov.

37. Annandale, N. 1906. Notes on the freshwater fauna of India. No. VIII. Some Himalayan Tadpoles. *J. Asiat. Soc. Bengal* (n.s.), 2 289-292.

Notes on some Himalayan Tadpoles and their habits.

*Bufo himalayanus* Gunther

*Megalophrys montana* Kuhl

*Rana liebigii* Gunther

*Rana* sp.

38. Annandale, N. 1906. Prefatory note on C.A. Paiva's notes on some rare and interesting insects added to the Indian Museum collection during the year 1905-06. *J. Asiat. Soc. Bengal* (n.s.), 2 345.

A prefatory note of the paper by C.A. Paiva

39. Annandale, N. 1906. Notes on the habits of the Earwig, *Labidura lividipes* Dufour. An addendum to Mr. Burr's paper entitled 'A further note on Earwigs in the Indian Museum' *J. Asiat. Soc. Bengal* (n.s.). 2 391.

This is an addendum of the note on *Labidura lividipes vicina* By Mr. Burr.

40. Annandale, Nelson, 1906. The common Hydra of Bengal its systematic position and life history. *Mem. Asiatic Soc. Bengal*, 1 339-359.

The common Hydra of Bengal is *Hydra orientalis*, and the present communication deals with the peculiarities in the structure and life history of the Bengal form.

41. Annandale, N. 1906. Natural history notes from the RIMS ship 'Investigator', Capt. T.H. Heming, R.N., Commanding, Series III, no. 12. Preliminary report on the Indian stalked barnacles. *Ann. Mag. of Nat. Hist.*, (7)17 389-400.

42. Annandale, N. 1906. Natural history notes from the RIMS ship 'Investigator' Capt. T.H. Heming, R.N., Commanding Series III, no. 13. Two new barnacles dredged in 1905-06. *Am. Mag. Nat. Hist.*, (7)18 44-47.
43. Annandale, N. 1906. Notes on the Fauna of Desert Tract in Southern India. Part I. Batrachian and Reptiles, with remarks on the Reptiles of the Desert region of the North-West Frontier. *Mem. As. Soc. Beng.*, 1 183-202, pls. ix, x.

**BATRACHIA**

*Rana cyanophlyctis*

*Rana greenii*

*Bufo melanostictus*

**REPTILIA**

*Testudo elegans*

*Nicoria trijuga* var. *thermalis*

*Hemidactylus frenatus*

*Hemidactylus brookii*

*Hemidactylus leschenaultii*

*Hemidactylus triedrus*

*Teratolepis scabriceps* sp. nov.

*Sitana ponticeriana*

*Calotes gigas*

*Mabuia bibronii*

*Lygosoma punctatum*

*Chamaeleon calcaratus*

*Typhlops braminus* var. *arenicola* var. nov.

*Typhlops limbrickii* sp. nov.

*Typhlops psammophilus*

*Eryx conicus*

*Eryx johnii*

*Lycodon striatus*

*Zamenis mucosus*

*Dendrophis pictus*

*Rtopidonotus piscator*

*Dryophis mycterizans*

*Dryophis mycterizans* var. *anomalus* nov.

*Naia tripudians*

*Echis carinatus*

44. Annandale, N. 1906. Report on the Cirripedia collected by Professor Herdman at Ceylon in 1902. *Rep. Ceylon Pearl Oyster Fisheries V* (Supplementary Reports 31) 137-150.
45. Annandale, N. 1906. On the Wild Swan of Seistan. *Ibis*, 612-613.
46. Annandale, N. 1906. New and interesting lizards of the Colombo Museum. *Spolia Zeylanica*, 3 189-192.

Family SCINCIDAE

*Lygosoma megalops* sp. nov.

*Theconyx* gen. nov. for *Euprepes halianus* Nevill

47. Annandale, N. 1906. Stalked Barnacles (Cirripedia Pedunculata) in the Colombo Museum. *Spolia Zeylanica*, 3 193-195.
48. Annandale, N. 1906. Lateral tract of Oriental Lorissinae. *Spolia Zeylanica*, 3 196.
49. Annandale N. and Paiva, C.A. 1906. Notes on the freshwater fauna of India, No. VI.—The life history of an aquatic Weevil. *J. Asiat. Soc. Beng.*, 2 197-200.

Description, habit and habitat of aquatic Weevil (Family Curculionidae) of Indian Museum tank, Calcutta and its life history are described.

50. Annandale, Nelson and Wroughton, R.C. 1906. The fauna of a desert tract in Southern India. Part II—Insecta and Arachnida. *Mem. Asiatic Soc. Bengal*, 1 203-219, pl. xi.
51. Annandale, N. 1907. The fauna of brackish ponds at port canning, Lower Bengal. Part I. Introduction and preliminary account of the fauna. *Rec. Indian Mus.*, 1 35-43.

Annandale described the following species from a pond at Port Canning :

Phylum PROTOZOA

*Carchesium polypinum*

*Folliculina ampulla*

**Phylum PORIFERA**

*Spongilla lacustris* var. *bengalensis*

*Spongilla cerebellata*

*Spongilla alba*, Carter

*Spongilla lacustris*

*Spongilla carteri*

**Phylum CNIDARIA**

*Metridium schillerianum*

*Irene ceylonensis*

*Bimeria vestita*

*Hydra* sp.

*Syncoryne* sp. (new species)

**Phylum MOLLUSCA**

*Hydrobia (Belgrandia) miliacea*

*Valvata microscopica*

*Blythinia* sp. (new species)

*Martesia* sp. (new species)

*Teredo* sp. (new species)

*Pharella* sp. (new species)

*Theora*, sp. (new species)

*Stenothyra blanfordiana*

*Corbula* spp. (five new species)

*Bithinella* sp. (new species)

*Ampullaria* sp.

*Onchidium* sp.

**Phylum NEMATODA**

*Oncholaimus* sp.

**Phylum GASTROTRICHA**

*Chaetonotus schulzei*

**Phylum POLYZOA**

*Victorella pavida*

*Membranipora bengalensis*

*Bowerbankia caudata* (Hincks)

**Phylum ARTHROPODA**

**Class CRUSTACEA**

*Varuna* sp.

*Ceriodaphnia rigaudi*  
*Cyclops leuckartii*  
*Balanus Amphitrite* var. *communis*  
*Balanus patellaris*  
*Chthamalus stellatus*

Class INSECTA

*Anopheles rossi*  
*Ischneura senegalensis*  
*Gerris* sp.  
*Hydrometra* sp.  
*Microvelis* sp.  
*Mesovelia* sp.  
*Laccotrephes* sp.  
*Nectocoris* sp.  
*Anisops* sp.  
*Plea* sp.  
*Sphaerodema* sp.  
*Cybister convexus*  
*Nymphula* sp.

Phylum CHORDATA

Class PISCES

*Symbranchus bengalensis*  
*Amblypharyngodon microlepis*  
*Macrones gulio*  
*Barbus chola*  
*Barbus stigma*  
*Nuria danrica*  
*Haplochilus melanostigma*  
*Haplochilus panchax*  
*Gobius acutipennis*  
*Gobius guiris*  
*Gobius alcockii*  
*Apocryptes lanceolatus*  
*Ophiocephalus punctatus*  
*Anabas scandens*  
*Trichogaster fasciatus*

*Periophthalmus koelreuteri*

*Boleophth viridis*

*Barbus chola*

*Haplochilus pacchax*

*Haplochilus melanostigma*

Class AMPHIBIA

*Rana cyanophlyctis*

*Rana tigrina*

*Bufo melanostictus*

Class REPTILIA

*Tropidonotus piscator*

52. Annandale, N. 1907. The fauna of brackish ponds at port canning, Lower Bengal. Part III. An isolated race of the Actinian *Metridium schillerianum* (Stoliczka). *Rec. Indian Mus.*, 1 47-76, pls. iii, iv..

*Metridium schillerianum* var. *exul*. var. nov.

53. Annandale, N. 1907. The appendicular skeleton of the Dugong. *Rec. Indian Mus.*, 1 79-80.

Described the appendicular skeleton of the Dugong *Halicornia dugong* from the Gulf of Mannar and compare it with that of Australian race.

54. Annandale, N. 1907. Melanic specimens of *Barbus ticto*. *Rec. Indian Mus.*, 1 81.

Described varying tendency towards melanism of the fish *Barbus ticto*.

55. Annandale, N. 1907. Two Barnacles new to Indian seas. *Rec. Indian Mus.*, 1 81.

Two species of Barnacles *Poecilasma gracile* Hoek and *Poecilasma eburneum* Hinds recorded for the first time from Indian Seas.

56. Annandale, N. 1907. Mosquitoes from Kumaon. *Rec. Indian Mus.*, 1 83.

The mosquitoes species *Anopheles lindesayi* (Giles), *Toxorhynchites immisericors* (Walker), *Stegomyia scutellaris* (Walker) and *Culex albopictus*, Skuse were first recorded from Vim Tal (4500 ft.)

57. Annandale, N. 1907. Peculiar habits of an earthworm. *Rec. Indian Mus.*, 1 83.

Observed the earthworm *Perionyx excavatus* in the hollows of trees which had become filled with dead leaves and rain-water.

58. Annandale, N. 1907. The fauna of brackish ponds at port canning, Lower Bengal. Part IV – Hydrozoa. *Rec. Indian Mus.*, 1 139-144.

Described 3 species of Hydrozoa from brackish ponds at Canning.

*Irene ceylonensis*

***Syncoryne filamentata* sp. nov.**

*Bimeria vestita* Wright

59. Annandale, N. 1907. Further note on a polyzoon from the Himalayas. *Rec. Indian Mus.*, 1 145-148.

Described *Lophopus lendenfeldi* var. *himalayanus* n.var. and comparative chart of 10 species of Polyzoon

*Plumatella princeps* Kraepelin

*Plumatella polymorpha* Kraepelin

*Plumatella philippinensis* Kraepelin

*Plumatella javanica* Kraepelin

*Plumatella punctata* Hancock

*Lophopus crystallinus* (Pallas)

*Lophopus lendenfeldi* Ridley

***Lophopus lendenfeldi* var. *indica* var. nov**

*Lophopus carteri* (Hyatt)

*Lophopus jheringi* Meissner

60. Annandale, N. 1907. Reports on a collection of Batrachia, Reptiles and Fishes from Nepal and the Western Himalayas. Introductory note. *Rec. Indian Mus.*, 1 149.

61. Annandale, N. 1907. Reports on a collection of Batrachia, Reptiles and Fishes from Nepal and the Western Himalayas. Lacertilia. *Rec. Indian Mus.*, 1 151-155, pl. vi.

Nine species of Lacertilia from Nepal and Western Himalayas are described.

***Hemidactylus nepalensis* sp. nov.**

*Acanthosaura major* ((Jerd.)

***Acanthosaura kumaonensis* sp. nov.**

*Acanthosaura tricarinata* (Blyth)

*Calotes versicolor* (Daud.)  
*Agama tuberculata* Gray  
*Mabuia maoularia* (Blyth.)  
*Lygosoma himalayanum* (Gunth)  
*Lygosoma sikkimense* Blyth

62. Annandale, N. 1907. The occurrence of the Taukte lizard (*Gecko verticillatus*) in Calcutta. *Rec. Indian Mus.*, 1 171.

63. Annandale, N. 1907. The distribution of *Kachuga sylhetensis*. *Rec. Indian Mus.*, 1 171.

New record of *Kachuga sylhetensis* from Rajshahi

64. Annandale, N. 1907. The distribution of *Bufo andersonii*. *Rec. Indian Mus.*, 1 171-172.

65. Annandale, N. 1907. A preoccupied specific name in *Macrothrix*. *Rec. Indian Mus.*, 1 176.

Annandale used in his earlier paper used a preoccupied name, viz., *Macrothrix tenuicornis*. Kurz used it many years ago for *M. rosea*. The *Macrothrix odiosa* should stand as a correction.

66. Annandale, N. 1907. An enemy of certain Pearl Oysters in the Persian Gulf. *Rec. Indian Mus.*, 1 176.

Enemy of three species of pearl oysters namely

*Avicula macroptera*, *Meleagrina vulgaris* and *Meleagrina margaritifera*

67. Annandale, N. 1907. The distribution in India of the African Snail, *Achatina fulica* Fer. *Rec. Indian Mus.*, 1 176-177.

68. Annandale, N. 1907. Statoblasts from the surface of a Himalayan Pond. *Rec. Indian Mus.*, 1 177.

Statoblast of the polyzoa *Plumatella emarginata*

69. Annandale, N. 1907. The fauna of brackish ponds at Port Canning, Lower Bengal. Part VI. - Observations on the Polyzoa, with further notes on the ponds. *Rec. Indian Mus.*, 1 : 197-205.

Describe the following fauna of a brackish water pond at Port Canning :

HYDROZOA

*Irene ceylonensis*

SIPUNCULA

*Physcosoma*

ACTINIAN

*Metridium schillerianum* var. *exul*

POLYZOA

*Victorella pavida*

*Bowerbankia caudate*

*Membranipora bengalensis*

70. Annandale, N. 1907. Notes on Freshwater Sponges. No. I – The buds of *Spongilla proliferens*. *Rec. Indian Mus.*, 1 267-268.

71. Annandale, N. 1907. Notes on Freshwater Sponges. No. II– Gemmules of *Trochospongilla phillottiana*. *Rec. Indian Mus.*, 1 269.

Phylum PORIFERA

*Trochospongilla phillottiana*

72. Annandale, N. 1907. Notes on Freshwater Sponges. No. III– Embryos of *Ephydatia blebbingia*. *Rec. Indian Mus.*, 1 269.

Phylum PORIFERA

*Ephydatia blebbingia*.

73. Annandale, N. 1907. Notes on Freshwater Sponges. No. IV– The nature of the pores in *Spongilla*. *Rec. Indian Mus.*, 1 270-271.

Phylum PORIFERA

*Spongilla proliferens*

*Spongilla crassissima*

74. Annandale, N. 1907. Notes on Freshwater Sponges. No. V– The systematic position of *Ephydatia meyeri* and *E. indica*. *Rec. Indian Mus.*, 1 272-273.

Phylum PORIFERA

*Ephydatia meyeri*

*Ephydatia indica*

*Ephydatia fluviatilis* var. *meyeri*

75. Annandale, N. 1907. Eggs of *Tylototriton verrucosus*. *Rec. Indian Mus.*, 1 278-279.

Amphibia, Urodele : *Tylototriton verrucosus*

76. Annandale, N. 1907. The hosts of *Tachaea spongillicola*. *Rec. Indian Mus.*, 1 279.

Isopoda : *Tachaea spongillicola*

77. Annandale, N. 1907. A second species of *Dichelaspis* from *Bathynomus giganteus*. *Rec. Indian Mus.*, 1 279-280.

ISOPODA

*Bathynomus giganteus*

BARNACLES

*Dichelaspis bathynomi*

78. Annandale, N. 1907. Notes on Freshwater sponges. No. VI – The midday siesta of *Spongilla* in the tropics. *Rec. Indian Mus.*, 1 387.

Water current of the sponges *Spongilla crassissima* and *Spongilla proliferens* stops in the midday

79. Annandale, N. 1907. Notes on Freshwater Sponges. No. VII – Description of two new freshwater sponges from Eastern Bengal, with remarks on allied forms. *Rec. Indian Mus.*, 1 387-397.

Phylum PORIFERA

*Spongilla reticulata* sp. nov.

*Spongilla alba*

*Spongilla crassior* sp. nov.

*Spongilla crassissima*

80. Annandale, N. 1907. A colour variety of *Typhlops braminus*. *Rec. Indian Mus.*, 1 397.

81. Annandale, N. 1907. Reptiles and a Batrachian from an Island in the Chilka Lake, Orissa. *Rec. Indian Mus.*, 1 397-398.

REPTILES

*Emyda vittata* Peters

*Hemidactylus frenatus*

*Hemidactylus brookii* Gray

*Calotes versicolor*

*Varanus nebulosus* (Gray)

AMPHIBIA

*Typhlops acutus*

*Cerberus rhynchops*

*Racophorus maculates* (Gray)

82. Annandale, N. 1907. Notes on the freshwater fauna of India, No. IX. Description of new freshwater sponges from Calcutta, with a record of two known species from the Himalayas and a list of the Indian forms. *J. As. Soc. Beng.* (n.s.), III 15-26.

Sponges described from Calcutta :

*Spongilla proliferens* sp. nov.

*Spongilla crassissima* sp. nov.

*Spongilla crassissima* var. *bigemmulata* var. Nov.

*Ephydatia indica* sp. nov.

*Trochospongilla latouchiana* sp. nov.

*Trochospongilla phillottiana* sp. nov.

Sponges described from Bhim Tal

*Spongilla carteri* Bowerbank

*Ephydatia robusta* (Potts)

With these a list of freshwater sponges recorded from India is also given.

83. Annandale, N. 1907. Notes on the freshwater fauna of India, No. X. *Hydra orientalis* during the rains. *J. As. Soc. Beng.* (n.s.), 3 27-28.

84. Annandale, N. 1907. Note on a specimen of *Felis tristis* Milne-Edwards, in the Indian Museum. *J. Asiat. Soc. Bengal* (n.s.), 3 29-31.

Description of *Felis tristis* Milne-Edwards present in the Indian Museum, purchased from China.

85. Annandale, N. 1907. Notes on the freshwater fauna of India, No. XI.- Preliminary notes on the occurrence of a medusa (*Irene ceylonensis* Browne) in a brackish pool in the Ganges delta and on the hydroid stage of the species. *J. Asiat. Soc. Bengal* (n.s.), 3 79-81, pl. ii, fig.5.

Description of a medusae *Irene ceylonensis* Brown collected in brackish pool at Port Canning.

86. Annandale, N. 1907. Notes on the freshwater fauna of India. No. XII. The Polyzoa occurring in Indian Fresh and brackish pools. *J. Asiat. Soc. Bengal* (n.s.), 3 83-93, pl. ii, figs. 1-4.

Described some Polyzoa occurring in Indian fresh and brackish pools.

#### CHEILOSTOMATA

*Membranipora bengalensis* Stoliczka – Gangetic delta (brackish water)

#### CTENOSTOMATA

*Victorella pavid*a Kent – Gangetic delta (brackish water)

*Paludicella* sp. – Bombay and Gangetic delta (brackish water)

*Hislopia lacustris* Carter – Nagpur and Calcutta (Freshwater)

#### PHYLACTOLAEMATA

*Plumatella repens* (Linn.) – Bombay and Calcutta

*Plumatella emarginata* Allman – Bombay and Calcutta

*Plumatella allmani* Hancock – Bhim Tal, Kumaon (4500ft.)

*Plumatella punctata* Hancock – Calcutta

*Lophopus lendenfeldi* Ridley – Bhim Tal, Kumaon

*Lophopus* sp. – Madras

*Pectinella carteri* Hyatt – Bombay

87. Annandale, N., Alcock, A., MacGilchrist, A.C. 1907. Illustrations of the Zoology of the Royal Indian Marine Survey Ship 'Investigator' under the command of Captain T.H. Heming. R.N. Crustacea (Malacostraca)–Pt. XII, pls. lxxvii-lxxix. Crustacea (Entomostraca). Pt. I, pls. I, ii (Calcutta, 1907).
88. Annandale, N., Alcock, A., Mac Gilchrist, A.C. 1907. Illustrations of the Zoology of the Royal Indian Marine Survey Ship 'Investigator', Pt. iv, pls. xiv-xviii. (Calcutta Review).
89. Annandale, N. 1908. The retirement of Lieutenant Colonel Alcock, with a list of his papers, etc., on Indian Zoology. *Rec. Indian Mus.*, 2 1-9.
- A small biography of Lieutenant Colonel A. W. Alcock, Superintendent of Indian Museum from May 1893 to December 1896 and a list of 65 Scientific papers on Indian Zoology Published by Alcock , 1890-1907 were incorporated.
90. Annandale, N. 1908. The fauna of brackish ponds at Port Canning, Lower Bengal. Part VII – Further observations on the Polyzoa, with the description of a new genus of Entoprocta. *Rec. Indian Mus.*, 2 11-19.

Phylum ECTOPROCTA

*Victorella bengalensis* sp. nov.

*Bowerbankia caudata*

Phylum ENTOPROCTA

*Loxosomatoides* gen. nov.

*Loxosomatoides colonialis* sp. nov.

91. Annandale, N. 1908. Notes on Freshwater Sponges. No. VIII – Preliminary notice of a collection from western India, with descriptions of two new species. *Rec. Indian Mus., Rec. Indian Mus.*, 2 25-28.

Recorded the following species from Western India :

*Spongilla lacustris*

*Spongilla cineria*

*Spongilla carteri*

*Spongilla bombayensis*

*Ephydatia indica*

Described two new species :

*Spongilla indica* sp. nov.

*Spongilla lapidosa* sp. nov.

92. Annandale, N. 1908. Description of a new species of lizard of the genus *Salea* from Assam. *Rec. Indian Mus.*, 2 37-38.

Described a new species of lizard

Class REPTILIA

*Salea austeniana* sp. nov.

93. Annandale, N. 1908. Notes on oriental Diptera. No. V. Description of a new species of Psychodid of the genus *Phlebotomus*. *Rec. Indian Mus.*, 2 101-104.

Described a new species of Diptera

*Phlebotomus argentipes* Annandale and Brunetti sp.nov.

94. Annandale, N. 1908. The habits of the Amphipod, *Quadrivisio bengalensis*. *Rec. Indian Mus.*, 2 107.
95. Annandale, N. 1908. The fauna of brackish ponds at Port Canning, Lower Bengal. Part IV. Observations on the Polyzoa, with further notes on the ponds. *Rec. Indian Mus.*, 2 109-110.

A sub-fossil Polyzoa

*Lepralia occlusa*

96. Annandale, N. 1908. Corrections as to the identity of Indian Phylactolaemata. *Rec. Indian Mus.*, 2 110.

*Lophopus lendenfeldi* var. *himalayanus* is corrected as *Pectinatella carteri*

*Plumatella repens* Linne of Calcutta is corrected as *Plumatella fruticosa* Allman

97. Annandale, N. 1908. Notes on freshwater sponges. No. IX – Preliminary notice of a collection from Burma, with the description of a new species of *Tubella*. *Rec. Indian Mus.*, 2 157-158.

Five species sponges recorded first time and description of a new species from Maymmer :

*Spongilla proliferens* Mihi

*Spongilla carteri* Bowerbank

*Spongilla loricata* var. *burmanica* Kirkpatrick

*Ephydatia indica* Mihi

*Trochospongilla latouchiana* Mihi

*Tubella vesparioides* sp. nov.

98. Annandale, N. 1908. Three Indian Phylactolaemata. *Rec. Indian Mus.*, 2 169-174.

Described three species of phylactolaemata, two of them are new species :

*Plumatella bombayensis* sp. nov

*Lophopus carteri* (Hyatt)

*Pectinatella burmanica* sp. nov.

99. Annandale, N. 1908. Notes on some Batrachia recently added to the collection of the Indian Museum. *Rec. Indian Mus.* 304-305.

Recorded the following species of Batrachia :

*Rana vicina* Stoliczka

*Rana doriae* Boulenger

*Rana laticeps* Boulenger

*Rana limborgi* Sclater

*Rana limnocharis* Wiegmann

*Rana nigrovittata* Blyth

*Ixalus cinerascens* Stoliczka  
*Ixalus annandalei* Boulenger  
*Bufo stomaticus* Lutken  
*Megalophrys parva* Boulenger

100. Annandale, N. 1908. Breeding habits of *Tylototriton verrucosus*. *Rec. Indian Mus.*, 2 305-306.

101. Annandale, N. 1908. Note on *Ephydatia meyeri* (Carter). *Rec. Indian Mus.*, 2 306-307.

Note on Sponge *Ephydatia meyeri* (Carter).

102. Annandale, N. 1908. Report on a collection of aquatic animals made in Tibet by Captain F.H. Stewart, IMS, during the year 1907. Observations on specimens of *Hydra* from Tibet, with notes on the distribution of the genus in Asia. *Rec. Indian Mus.*, 2 311-313.

*Hydra fusca* Linnaeus

Several specimens from among weeds in the Rham-Tso Lake at an altitude of about 15,000 ft; taken in August, 1907 by Capt. F.H. Stewart. During a visit to Burma (March, 1908) Annandale found a *Hydra*, apparently identical with specimens from Calcutta, common in a pond at Mandalay; while in a small pool near Moulmein, in Lower Burma, he took a single polyp, which was of an 'oil-green' colour and had eight tentacles. None of these specimens showed any sign of sexual activity, but several of the Mandalay examples bore buds. The nematocysts of all agreed with those of *H. orientalis*, to which he therefore assigned even the Moulmen specimen, in spite of its eight tentacles. Such identifications, however, no gonads being present, can only be provisional.

Turkestan & Siberia : *Hydra fusca*

Tibet : *Hydra fusca*

India : *Hydra orientalis*, *Hydra fusca*, *Hydra spp.*

Ceylon : *Hydra orientalis*,

Malay : *Hydra orientalis*

Tonquin : *Hydra fusca*

103. Annandale, N. 1908. Report on a collection of aquatic animals made in Tibet by Captain F.H. Stewart. Description of the Tadpole Description of the Tadpole of *Rana pleskii*, with notes on allied forms. *Rec. Indian Mus.*, 2 345-346.

Description of the Tadpole of *Rana pleskii* Gunther with notes on  
*Rana vicina* Stoliczka and *Rana liebigii* Annandale

104. Annandale, N. 1908. A new Sting Ray of the genus *Trygon* from the Bay of Bengal. *Rec. Indian Mus.*, **2** 393-394.

Class PISCES

*Trigon microps* sp. nov.

105. Annandale, N. 1908. Diagnosis of a living species of the genus *Diplonema* (Psychodid Diptera). *J. Asiat. Soc. Bengal* (n.s.). **4** 353-354.

*Diplonema superstes* sp. nov.

106. Annandale, N. 1908. Notes on some freshwater sponges collected in Scotland. *J. Linn. Soc. London, Zool.*, **30** 244-250.

107. Annandale, N. 1908. The Bombay 'Spiny Lobster' *J. Bombay Nat. Hist. Soc.*, **18** . 927.

As Captain Powell's valuable account of the Bombay Spiny Lobster in a recent number of *J. Bombay Nat. Hist. Soc.* (vol. XVIII, No. 2, p.360) suffers from the fact that the species he describes has not been identified. Rev. T. R. R. Stebbing says in his History of Crustacea (London, 1893) '*Palinurus* Fabricius, 1797, is restricted by Spence Bate to those species which have a small central rostriform tooth or tubercle that overhangs but does not cover or enclose the ocular segment, which to the first antennal, and in which the segment that carries those antennalis anteriorly produced and laterally compressed in front. Such species appears to be confined in the northern hemisphere (p.195). *Palinurus* White, 1847, contains the numerous eastern and one or two western species, in which there is no central rostriform tooth, which have the ocular segment exposed and membranous, the flagella of the first antennal long and slender, and their segment produced considerably in advance of the frontal margin, that being generally armed with strong teeth. The most abundant species of *Palinurus* in Indian seas is *Palinurus fasciatus* Fabricius, which is probably that with which Captain Powell deals; but other occur, notably the deep-sea form *Palinurus angulatus*, Spence Bate, which is not uncommon at depths from 143 to 710 fathoms in the Arabian Sea.

108. Annandale, N. 1908. Second note on a Recent Estuarine Deposit below Clive Street, Calcutta. *Rec. Geol. Surv. India.*, **37** 221-223.

109. Annandale, N. 1908. An unknown Lemur from the Lushai Hills, Assam. *Proc. Zool. Soc. London* 888-889.
- Annandale received two photographs of unknown Lemur from the Lusai Hills, Assam. He compared it with all the other genera of Lemur but was not able to identify upto genus level.
110. Annandale, N. 1908. Recent additions to the collection of Entozoa in the Indian Museum. *Rec. Indian Mus.*, 2 431-435.
111. Annandale, N. & Lloyd, R.E. 1908. Illustrations of the Zoology of the Royal Indian Marine Survey Ship 'Investigator' Pl. xix, xx. (Calcutta Review).
112. Annandale, N. & Stewart, F.H. 1908. Illustrations of the Zoology of the Royal Indian Marine Survey Ship 'Investigator' Pl. xxi, xxiii. (Calcutta Review).
113. Annandale, N. 1909. Report on the fishes taken by the Bengal Fisheries Steamer 'Golden Crown' Part I – Batoidei. *Memoirs of the Indian Museum*, 2 1-58.

List of the Batoidei recorded from Indian Seas described with the keys up to the species, figures and plates

Family PRISTIDAE

*Pristis cuspidatus*

*Pristis perottetii*

*Pristis pectinatus*

*Pristis pectinatus* var. *annandalei*

*Pristis zysron*

Family RHINOBATIDAE

*Rhampobatis ancylostomus*

*Rhinobatis djeddensis*

*Rhinobatis halavit*

*Rhinobatis granulatus*

*Rhinobatis thoiini*

*Rhinobatis columnse*

*Rhinobatis schlegelii*

Family RAJIDAE

*Raja mamillidens*

*Raja johannis-davisi*

*Raja reversa*  
*Raja* sp. nov  
*Raja powellii*  
*Raja philipii* (?) (= *R. powellii*)  
*Platyrrhua schonleinii*.

Family TRYGONIDAE

*Trygon microps*  
*Trygon uarnak*  
*Trygon gerrardii*  
***Trygon favus* sp. nov.**  
*Trygon bleekeri*  
***Trygon alcockii* sp. nov.**  
***Trygon jenkinsii* sp. nov.**  
*Trygon marginatus*  
*Trygon bennettii*.  
*Trygon imbricata*  
*Trygon zugei*  
*Trygon kuhlii*  
*Hypolophus sephen*  
*Taeniura melanospilos*  
*Urogymnus asperrimus*  
***Urogymnus laevior* sp. nov.**  
*Pteroplatea micrura*  
*Pteroplatea zonura*  
*Pteroplatea tentaculata*

Family TORPEDINIDAE

*Torpedo marmorata*  
*Narcine tinglei*  
***Narcine brunnea* sp. nov.**  
*Narcine mollis*  
*Benthobatis moresbyi*  
*Astrape dipterygia*  
***Bengalichthys impennis* gen. et sp., nov.**

Family MYLIOBATIDAE

*Rhinoptera javanica*  
*Rhinoptera adspersa*

*Myliobatis nieuhofii*  
*Myliobatis nieuhofii* var. *cornifera*  
*Myliobatis maculata*  
*Aëtobatis guttata*  
*Aëtobatis flagellum*  
Family CERATOPTERIDAE  
*Dicerobatis eregoodoo*  
*Dicerobatis thurstoni*  
*Dicerobatis kuhlii*  
*Ceratoptera orissa*

114. Annandale, N. 1909. An account of the Indian Cirripedia Pedunculata. Part I – Family Lepadidae (*Sensu stricto*). *Mem. Indian Mus.*, 2 59-137.
115. Annandale, N. 1909. Report on the fishes taken by the Bengal Fisheries Steamer 'Golden Crown' Part II – Additional notes the Batoidei. *Memoirs of the Indian Museum*, 3(1) : 1-5.

Family TRYGONIDAE  
*Trygon uarnak* (Forskel)  
*Trygon gerrardii* Gray  
*Trygon fluviatilis* (Ham. Buch.)  
*Trygon fluviatilis* (Ham. Buch.)

Family MYLIOBATIDAE  
*Aetobatis narinari* (Euphrasen).

116. Annandale, N. 1909. Notes on freshwater sponges. No. X – Report on a small collection from Travancore. *Rec. Indian Mus.*, 3 101-104.

*Spongilla travancorica* sp. nov.  
*Tuhcila pcnnsylvaiiica* Potts.  
*Pectispongilla aurea* sp. nov.

117. Annandale, N. 1909. A pelagic sea-anemone without tentacles. *Rec. Indian Mus.*, 3 157-162.

*Anactinia pelagica* sp. nov.

118. Annandale, N. 1909. Report on small collection of lizards from Travancore. *Rec. Indian Mus.*, 3 253-257.

Described the following species of lizards :

*Gonatodes ornatus*

*Gonatodes kandianus*

*Hemidactylus brookii*

*Hemidactylus leschenaultii*

*Draco dussumieri*

*Otocryptis heddomii*

*Calotes versicolor*

*Calotes ophiomachus*

*Charasia hlanfordiana*

*Mahuia carinata*

*Lygosoma dussumieri*

***Lvgosonia dawsonii*, sp. nov.**

*Lygosoma albopunctatuni*

*Ristella guentheri*.

*Ristella beddomji*

119. Annandale, N. 1909. Description of a Barnacle of the genus *Scalpellum* from Malaysia. *Rec. Indian Mus.*, 3 267-270.

***Scalpellum (Smillum) kampeni* sp. nov.**

120. Annandale, N. 1909. Notes on freshwater sponges. No. XI. Description of a new species of *Spongilla* from Orissa. *Rec. Indian Mus.*, 3 275.

***Spongilla hemephydatia* sp. nov.**

121. Annandale, N. 1909. Preliminary note on a new genus of Phylactolaematous Polyzoa. *Rec. Indian Mus.*, 3 279-280.

***Stolella Indica* sp. nov.**

122. Annandale, N. 1909. Major wall on some forms of *Dipsadomorphus*. *Rec. Indian Mus.*, 3 : 281-282.

Synonymised four species of *Dipsadomorphus* (Reptilia) as *D. ceylonensis* by comparing their wall structure.

123. Annandale, N. 1909. Notes on Indian Batrachia. *Rec. Indian Mus.*, 3 282-286.

Described 16 species of Amphibians

*Rana vicina* Stoliczka.

*Btifo stoniatic'us* Lutken

*Rana hexadaciyla*

*Rana cyanophlyctis*

*Rana verrucosa*

*Rana tigrina*

*Rana limnocharis*

*Rana beddo'nii*

*Rana leptodactyla*

*Rana temporalis*

*Rhacophorus maculates*

*Micrixalus fusciis*

*Ixalus nasulus*

*Microliyla rubra*

*Bujo inelanostictus*

*Ichthyophis gluiinosa*

124. Annandale, N. 1909. Field notes on Indian Insects. *Rec. Indian Mus.*, 3 293-294.

Described 3 insects

*Myrmecophila quadrispina*

*Tetigoniella ferruginea* Fabr.

*Podalirius pulcherrims.*

125. Annandale, N. 1909. The habits of Indian King Crabs. *Rec. Indian Mus.*, 3 294-295.

Described 2 species of King Crab

*Limulus moluccanus*

*Limulus (Carcinoscorpius) rotundicauda*

126. Annandale, N. 1909. The rate of growth in *Conchoderma* and *Lepas*. *Rec. Indian Mus.*, 3 : 295.

Observation on growth in two crustaceans

*Lepas anserifera*

*Conchoderma virgaluni* var. *hunteri*

127. Annandale, N. 1909. Description of a minute Hymenopterous insects from Calcutta. *Rec. Indian Mus.*, 3 299-300.

Described a new species of Hymenoptera

*Alaptus magnanimous* sp. nov.

128. Annandale, N. 1909. A new species of *Fredericella* from Indian Lakes. *Rec. Indian Mus.*, 3 373-374.

*Fredericella indica* sp. nov.

129. Annandale, N, 1909. Fresh-water sponges collected in the Philippines by the Albatross expedition. *Proc. United States Nat. Mus.*, 37 131-132

130. Annandale, Nelson, 1909. Fresh-water sponges in the collection of the United States National Museum. Part-I. Specimens from the Philippines and Australia. *Proceedings of United states National Museum*, vol. 36 627-632.

131. Annandale, Nelson, 1909. Fresh-water sponges in the collection of the United States National Museum- Part II. Specimens from North and South America. *Proc. United States Nat. Mus.*, 37 : 401-406.

132. Annandale, N. 1909. Beiträge zur Kenntnis der Fauna von Süd-Afrika, Ergebnisse einer Reise von Prof. Max Weber im Jahre 1894, IX. Freshwater sponges. *Zool. Jahrb. Syst.*, 27 559-568.

133. Annandale, N. & Horn, W. 1909. Annotated list of the Asiatic Beetles in the collection of the Indian Museum, Part I, Family Carabidae, subfamily Cicindelinae. Pub. D'Rozario, Calcutta.

134. Annandale, N. 1909. Report on a collection of freshwater sponges, from Japan. *Annotationes Zoologicae Japonenses*, VII 105-112, pl. ii.

135. Annandale, N. 1909. Freshwater sponges from New Guinea. *Résultats de l'Expédition scientifique Néerlandaise a' la Nouvelle Guinée*, 5 421-422.

136. Annandale, N. 1909. Description d'une nouvelle espèce de sponges d'eau douce du lac de Genève. *Spongilla Helvetica*, sp. nov. *Rev Suisse Zool Genève*, 17 367-369.

*Spongilla helvetica* sp. nov.

137. Annandale, N. 1909. Freshwater sponges in the collection of the United States National Museum. Part I. Specimens from the Philippines and Australia. No. 1690. June, 19. *Proc. U.S. Nat. Mus.*, 627-632.

***Spongilla philippinensis* sp. nov.**

***Spongilla clementis* sp. nov.**

138. Annandale, N. 1909. Freshwater sponges in the collection of the United States National Museum. Part II. Specimens from North and South America. No. 1712. December 22, 1909. *Proc. U. S. Nat. Mus.*, 37 401-406.
139. Annandale, N. and Jenkins, J.T. 1909. Report on the fishes taken by the Bengal Fisheries Steamer 'Golden Crown' Part III – Plectognathi and Pediculati. *Memoirs of the Indian Museum*, 3(1) 7-21.

Described list of the plectognathi of indian seas with key up to the species

**SCLERODERMI**

**Fam. TRIACANTHIDAE**

*Triacanthus brevirostris*

*Triacanthus oxycephalus*

*Triacanthus strigilifer*

*Triacanthus weberi*

*Triacanthodes ethiops*

*Halimochirurgus centriscoides*

**Fam. TRIODONTIDAE**

*Triodon bursarius*

**Fam. BAUSTIDAE**

*Balistes stellaris*

*Balistes maculatus*

*Balistes vetula*

*Balistes niger*

*Balistes mitis*

*Balistes conspicillum*

*Balistes viridescens*

*Balistes fuscus*

*Balistes flavimarginatus*

*Balistes ellioti*

*Balistes aculeatus*

*Balistes rectangulus*

*Balistes undulatus*

*Balistes buniva.*  
*Bahstes erythron*  
*Monacanthus oculatus*  
*Monacanthus nematophorus*  
*Monacanthus setifer*  
*Monacanthus choerocephalus*  
*Monacanthus tomentosus*  
*Aluterus monoceros*  
*Aluterus scriptus*  
*Aluterus nasicornis*  
*Anacanthus barbatus*

Fam. OSTRACIONTIDAE.

*Ostracion gibbosus*  
*Ostracion cubicus*  
*Ostracion punctatus*  
*Ostracion nasus*  
*Ostracion comutus*  
*Ostracion fornasini*

GYMNODONTES

Fam. TETRODONTIDAE

*Tetrodon lunaris*  
*Tetrodon inermis*  
*Tetrodon sceleratus*  
*Tetrodon hypselogenion*  
*Tetrodon oblongus*  
*Tetrodon spinosissimus*  
*Tetrodon patoca*  
*Tetrodon cutcutia*  
*Tetrodon immaculatus*  
*Tetrodon nigropunctatus*  
*Tetrodon stellatus*  
*Tetrodon reticularis*  
*Tetrodon hispidus*  
*Tetrodon leopardus*  
*Tetrodon viridipunctatus*  
*Tetrodon fluviatilis*

*Tropidichthys investigatoris* sp. nov.

*Tropidichthys valentini*

*Tropidichthys bennettii*

*Tropidichthys margaritatus*

Family DIODONTIDAE

*Diodon hystrix*

*Diodon maculatus*

*Diodon orbicularis*

Family MOLIDAE

*Orthogoriscus* sp.

140. Annandale, N. & Stewart, F.H. 1909 Illustrations of the zoology of the Royal Indian Marine Survey Ship Investigator....*Mollusca*, pt. VI, pls. XXI-XXIII. Publisher Indian Museum, Calcutta.
141. Annandale, N. 1910. Fresh water sponges collected in the Philippines by the 'Albatross' Expedition.- No. 1702. October, 23, 1909. *Proc. U.S. Nat. Mus.*, 37 131-132.

*Spongilla microsclerifera* sp. nov.

142. Annandale, N. 1910. Fresh water sponges in the collection of the United States National Museum. Part III. Description of a new species of *Spongilla* from China. *Proc. U.S. Nat. Mus.*, 38 183.
143. Annandale, Nelson, 1910. Fresh-water sponges in the collection of the United States National Museum.- Part IV. Note on the fresh-water sponge, *Ephydatia japonica*, and its allies. *Proc. United States Nat. Mus.*, 38 649-650.
144. Annandale, Nelson, 1910. "Sand-flies" (*Phlebotomus*) from Peradeniya. *Spolia zeylanica*, 7 57-62.

Three species of sand flies (*Phlebotomus*) are described from Peradeniya with their keys.

*Phlebotomus argentipes* Annandale and Brunetti

*Phlebotomus babu* Annandale

*Phlebotomus marginatus* sp. nov.

145. Annandale, N. 1910. The Indian species of Papataci fly (*Phlebotomus*). *Rec. Indian Mus.*, 4 35-52.

List of known species of *Phlebotomus* with the description and key to the species and of papers in which they are described are incorporated.

*Phlebotomus papatasi* Scopoli

*Phlebotomus minutus* Rondani

*Phlebotomus mascittii* Grassi

*Phlebotomus tipuliformis* Meunier

*Phlebotomus vexator* Coquillet

*Phlebotomus cruciatus* Coquillet

*Phlebotomus duboscqui* Neveu-Lemaire

*Phlebotomus papatasi* Scopoli

***Phlebotomus himalayensis* sp. nov.**

***Phlebotomus malabaricus* sp. nov.**

*Phlebotomus perturbans* Meijere

***Phlebotomus babu* sp. nov.**

***Phlebotomus major* sp. nov.**

*Phlebotomus argentipes* Annandale and Brunetti

146. Annandale, N. 1910. Further notes on Indian Phlebotomi. *Rec. Indian Mus.*, 4 319-320.

Following species of Indian Phlebotomi were described

*Phlebotomus argentipes* Annandale and Brunetti.

*Phlebotomus argentipes* var. *marginatus* Annandale.

*Phlebotomus major* Annandale.

***Phlebotomus major* var. *grisea* nov.**

*Phlebotomus babu* Annandale.

***Phlebotomus babu* var. *niger* nov.**

*Phlebotomus papatasi* (Scopoli)

147. Annandale, N. 1910. Report on the fishes taken by the Bengal Fisheries steamer "Golden Crown" Part II – Additional notes on the Batoidei. *Mem. Indian Mus.*, 3 1-5.

148. Annandale, N. & Kemp, S. 1910. Fauna of Chilka Lake, Introduction. *Mem. Indian Mus.*, 5 1-20.

Introduction of the fauna of Chilka Lake is incorporated.

149. Annandale, N. 1910. Notes on freshwater sponges. No. XII. Description of a new species from Cape Comorin. *Rec. Indian Mus.*, 5 31.

Described a new species of freshwater sponge from Cape Comorin  
***Spongilla ultima*, sp. nov.**

150. Annandale, N. 1910. Materials for a revision of the Phylactolaematous Polyzoa of India. *Rec. Indian Mus.*, 5 37-57.

Revised Phylactolaematous Polyzoa of India and described the following species with keys

*Fredericella indica* Annandale

*Plumatella repcns* Allman (? Linne)

*Plumatella fruticosa* Allman

*Plumatella emarginata* Allman

*Plumatella allmani* Hancock

Var. A. (*P. allmani* Hancock.)

Var. B. (*P. dumortieri* Allman.)

Var. C. (*P. diffusa* Leidy.)

*Plumatella javanica* Kraepelin

*Plumatella Philippinensis*

*Plumatella bombayensis* Annandale

*Plumatella punctata* Hancock

*Stolella indica* Annandale

*Lophopodella carteri* (Hyatt).

*Pcctinatella burmanica* Annandale

151. Annandale, N. 1910. An undescribed Burmese frog allied to *Rana tigrina*. *Rec. Indian Mus.*, 5 79.

Described a new species of *Rana* from Burma

***Rana burkilli* sp. nov.**

152. Annandale, N. 1910. An albino owl. *Rec. Indian Mus.*, 5 81.

Described an albino Owl received at the Indian Museum

*Athene brama*

153. Annandale, N. 1910. Description of a new species of *Scalpellum* from the Andaman Sea. *Rec. Indian Mus.*, 5 115-116.

Described a new species of barnacle

***Scalpellum lambda* sp. nov.**

154. Annandale, N. 1910. A new genus of Psychodid Diptera from the Himalayas and Travancore. *Rec. Indian Mus.*, 5 141-144.

Described a new genus of Psychodid Diptera

***Brunettia* gen. nov.**

***Brunettia travancorica* sp. nov.**

*Brunettia superstes* (Annandale)

155. Annandale, N. 1910. The Indian barnacles of the sub-genus *Smilium*, with remarks on the classification of the genus *Scalpellum*. *Rec. Indian Mus.*, 5 145-155.

Describe species of barnacle of sub-genus *Smilium* of the genus *Scalpellum* with the key

*Scalpellum (Smilium) squamuliferum* Weltner.

*Scalpellum (Smilium) hengalense* Annandale.

*Scalpellum (Smilium) acutum* Hoek.

156. Annandale, N. 1910. Description of a South Indian Frog allied to *Rana corrugata* of Ceylon. *Rec. Indian Mus.*, 5 : 191.

Described a new species of frog

***Rana travancorica* sp. nov.**

157. Annandale, N. 1910. Contribution to the fauna of Yunnan. Part I.—Sponges and Polyzoa. *Rec. Indian Mus.*, 5 197-199.

Described sponges and polyzoa of Yunnan

SPONGES

*Spongilla (Euspongilla) proliferens* Annandale.

***Spongilla* (? *Euspongilla*) *yunnanensis* sp. nov.**

***Spongilla* (? *Stratospongilla*) *coggini* sp. nov.**

POLYZOA

*Plumatella javanica* Kraepelin.

158. Annandale, N. 1910. Notes on the Darjiling Skink (*Lygosoma sikkimense*). *Rec. Indian Mus.*, 5 201.

Notes on a lizard of Darjiling

*Lygosoma sikkimense*

159. Annandale, N. 1910. Cockroaches as predatory insects. *Rec. Indian Mus.*, 5 201-202.

Described a behaviour of cockroach : *Periplaneta americana*

160. Annandale, N. 1910. Two barnacles of the genus *Dichelaspis* new to Indian Seas. *Rec. Indian Mus.*, 5 213-214.

Two species of barnacles new record to India

*Dichelaspis orthogonia* Darwin

*Dichelaspis nierstraszi* Hoek.

161. Annandale, N. 1910. Note on slugs from the Eastern Himalayas. *Rec. Indian Mus.*, 5 214-215.

Note on Slugs from Kurseong, in the Darjiling district

*Austenia sikkimense* var. *mainwaringi*, G.A.

*Austenia annandalei* G.A.

*Cryptaustenia succinea* (Rve.).

162. Annandale, N. 1910. Sandflies (*Phlebotomus*) from Peradeniya. *Spolia zeylanica*. 5 57-62.

163. Annandale, N. 1910. Description of a new species of *Spongilla* from China. Pub. : Washington, Gov. Prtg. Off.

164. Annandale, N. 1910. Notes on Cirripedia Pedunculata in the collection of the University of Copenhagen. *Kobenhavn Nat. Medd.*, 211-218, pl. iii.

165. Annandale, N. 1910. Report on the Cirripedia Pedunculata collected by Dr. Th. Mortensen in the Gulf of Siam. *Vidensk. Meddel. Fra den Naturh. Foren. Kjôbenhavn* 81-86.

166. Annandale, N. 1910. Fresh-water sponges collected in the Philippines by the Albatross Expedition. No. 1702, October 23, 1909, *Proc. U.S. Nat. Mus.* Washington 131-132.

*Spongilla microsclerifera* sp. nov.

167. Annandale, N. 1910. Freshwater sponges in the collection of the United States National Museum. Part II. Specimens from North and South America. – No. 1712. December 22, 1909. *Proc. U.S. Nat. Mus.* Washington, 401- 406.

168. Annandale, N. 1910. Description of a new species of *Spongilla* from China. Washington, Gov. Prtg. Off.

169. Annandale, N. 1910. Indian barnacles of the subgenus *Smilium*. Washington, Gov. Prtg. Off.

170. Annandale, N. 1910. Description of an undescribed Barnacle of the Genus *Scalpellum* from New Zealand. *Trans. New Zealand Inst.*, 43 164-165, Article XX.

171. Annandale, N. 1910. New volumes of the 'Fauna' *J. Bombay Nat. Hist. Soc.* XX, p. 533.

With reference to the Imperial Entomologist's list (*J. Bombay Nat. Hist. Soc.*, vol. XX, pg. 203) of the volumes sanctioned by the Secretary of State for publication in the *Fauna of British India and Ceylon*, may I inform your readers that the two additional volumes have recently been sanctioned and are now in the course of preparation in the Indian Museum, Calcutta. They are to deal with (1) the Nemocera other than mosquitoes and Chironomidae (crane-flies or daddy-long-legs, fungus-midges, moth-flies etc.) by Mr. E. Brunetti and (2) the sponges, coelenterates and polyzoa of stagnant water by myself. Most Indian Zoologists will agree as to the importance of rendering the official 'Fauna of India' as complete as possible, and I have, therefore, no hesitation in appealing for assistance to the members of the Society. At last it is found possible to sanction the preparation of part of the 'Fauna' in the country with the animals of which it deals.

172. Annandale, N. & Jenkins, J.T. 1910. Part report on the fishes taken by the Bengal Fisheries steamer, 'Golden Crown' III. Plectognathi and Pediculati. *Mem. Indian Mus.*, 3 7-21.
173. Annandale, N. & Jenkins, J.T. 1910. Report on the fishes taken by the Bengal fisheries steamer 'Golden Crown' Indian Museum, Calcutta, May 1909 - November 1910.
174. Annandale, N. & Kemp, S. 1910. Fauna of Chilka Lake. Aquatic Insects, other than coleopteran, with notes on some marginal species. *Mem. Indian Mus.*, 5 175-189. Pl. xi.
175. Annandale, N. 1911. Note on Rhizocephalous Crustacean from freshwater and on some specimens of the order from Indian Seas. *Rec. Indian Mus.*, 6 1-4.

Described the habitat of Rhizocephalons crustacean from freshwater as well as sea.

176. Annandale, N. 1911. Some sponges associated with gregarious molluscs of the family Vermetidae. *Rec. Indian Mus.*, 6 47-55.

Described Some sponges associated with gregarious molluscs.

*Racodiscula sceptrifera* (Carter).

*Racodiscula sceptrifera* Var. *sproglyphi* nov.

*Racodiscula sceptrifera* Var. *sillquariae* nov.

*Spongosoritcs topsenti* Dendy

177. Annandale, N. 1911. Note on aquatic Rhynchota. *Rec. Indian Mus.*, **6** 111-112.

Redescription of 3 species of aquatic *rhynchota*

*Euratas formidabilis* Distant

*Fabatus servus* Distant

*Perittopus rufus* Distant

178. Annandale, N. 1911. Systematic notes on the Ctenostomatous Polyzoa of freshwater. *Rec. Indian Mus.*, **6** 193-201.

Described some Ctenostomatous Polyzoa of freshwater.

*Paludicella ehrenbergi*, van Beneden

*Pottsiella erecta* (Potts)

*Victorella mulleri* (Kraepelin)

*Victorella pavid*a, Kent.

*Victorella bengalensis* Annandale

*Victorella symbiotica* Rousselet

*Arachnoidea ray-lankesteri* Moore

*Hislopia lacustris* Carter

179. Annandale, N. 1911. Contributions to the fauna of Yunnan based on collections made by J. Coggin Brown, 1909-1910. Part VI – Batrachia and Reptiles. *Rec. Indian Mus.*, **6** 215-218.

Described some Batrachia and Reptiles of Yunnan.

#### BATRACHIA

*Tylotriton verrucosus*. Anderson

*Megalophrys carinensis* (Boulenger)

*Megalophrys major* Boulenger

*Bufo melanostictus* Schneider

*Hyla chinensis* Gunther

#### REPTILES

*Japalura yunnanensis* Anderson

*Acanthosaura dymondi* Boulenger

*Ablabes porphyraceus* (Cantor)

*Zaocys nigromarginatus* (Blyth)

*Coluber taeniurus* Cope

*Coluber prasinus* Blyth

*Helicops schistosus* subsp. *yunnanensis* (Anderson)

*Tropidonotus stolatus* (Linn.)

*Tropidonotus nuchalis* Boulenger

*Bungarus fasciatus* (Schneider)

180. Annandale, N. 1911. Notes on freshwater sponges. No. XIII – Specimens collected in the Poona district, Bombay Presidency by S.P. Agharkar. *Rec. Indian Mus.*, 6 225-226.

Described freshwater sponges collected from the Poona district.

*Spongilla (Euspongilla) cinerea* Carter

*Spongilla (Stratospongilla) bombayensis* Carter

*Corvospongilla burmanica* subsp. *bombayensis* nov.

181. Annandale, N. 1911. On the distribution of the different forms of the genus *Ibla*. *Rec. Indian Mus.*, 6 229-230.

Described the distribution of the genus *Ibla* (Crustacea, Cirripedia, Pedunculata)

*Ibla quadrivalvis* (Cuvier)

*Ibla cummingi* Darwin

*Ibla sibogae*

182. Annandale, N. 1911. Fresh water sponges in the collection of the United States National Museum. Part III. Description of a new species of *Spongilla* from China. No. 1737. June 6, 1910. *Proc. U.S. Nat. Mus.* Washington, 38 183.

*Spongilla (Stratospongilla) sinensis* sp. nov.

183. Annandale, N. 1911. Fresh water sponges in the collection of the United States National Museum. Part IV. Note on the fresh water sponge, *Ephydatia japonica*, and its allies. No. 1771. October 18, 1910. *Proc. U.S. Nat. Mus.* Washington, 38 649-650.

184. Annandale, N. 1911. Fresh water sponges in the collection of the United States National Museum. Part V. A new genus proposed, with *Heteromeyenia radiospiculata* Mills as type. *Proc. U.S. Nat. Mus.*, 40 593-594.

*Heteromeyenia* gen. nov.

*Heteromeyenia radiospiculata* sp. nov.

185. Annandale, N. 1911. Note on specimens of sponges associated with the shells of gregarious molluscs of the family Vermetidae in the Bay of Bengal. *J. Asiat. Soc. Bengal* (n.s.), 7 99.

186. Annandale, N. 1911. Note on a freshwater sponge and Polyzoon from Ceylon. *Spolia Zeylanica*, 7 : 63-64, pl. 1.

FRESHWATER SPONGES

*Spongilla proliferens*

*Spongilla carteri*

POLYZOA

*Plumatella princeps* Kraeplin

*Plectinatella burmanica*

187. Annandale, N. 1911. Correction as regards the Ceylon species of 'Phlebotomus' *Spolia Zeylanica*, 7 159.

*Phlebotomus marginatus*

*Phlebotomus argentipes*

*Phlebotomus zeylanicus*

*Phlebotomus babu*

188. Annandale, N. 1911. A new genus of short-beaked Gnats from Ceylon. *Spolia Zeylanica*, 7 187-193, pl. 1.

***Ramica* gen. nov.**

***Ramica inepta* sp. nov.**

189. Annandale, N. 1911. Further note on flies of the genus *Phlebotomus*. *Spolia Zeylanica*, 7 203-204.

*Phlebotomus marginatus* is synonymised as *Phlebotomus argentipes* var. *marginatus*

*Phlebotomus argentipes*

*Phlebotomus zeylanicus*

*Phlebotomus babu*

*Phlebotomus papatasi*

*Phlebotomus major*

190. Annandale, N. 1911. Description of a micropterous fly of the family Phoridae associated with ants. *Spolia Zeylanica*, 8 85-89, pl. 1.

***Rhynchomicropteron* Gen. nov**

***Rhynchomicropteron pulcifforme* sp. nov.**

191. Annandale, N. 1911. Note on the rate of growth of Barnacles in Indian Seas. *J. Bombay nat. Hist. Soc.* 20 1170-1172.

It is well known that both Acorn Barnacles (*Operculata*) and the stalked species (*Pedunculata*) are hatched from eggs as minute free swimming larvae of the 'Nauplius' type. After a short period of active life, their form changes and they settle down on some solid object, to which they finally fix themselves, in this position they attain the adult form. As regard pedunculates from Indian seas, I only know of one precise statement (Rec. Ind. Mus. Pg. 295), which was based on an observation made by Dr. J. Travis Jenkins. A clean Buoy was moored off the Madras Coast on 23<sup>rd</sup> February, 1910 and was lifted on March 3<sup>rd</sup> of the same year. On it were found numerous specimens of *Lepas anserifera* and *Conchoderma virgatum* var. *hunteri*. The largest of the former measured 8 mm capitular length and of the later 15 mm. The species of *Conchoderma* found on the buoy is confined to the Indian Ocean and probably does not attain the same dimension as the typical form of the species. The observations on barnacles are scattered and incomplete as they give some idea of the rapid growth of barnacles on ships' bottoms and in similar situations, but valuable observations of a more precise nature might be made without much difficulty in a sea-port provided like Bombay with an extensive harbor.

192. Annandale, N. 1911. Some Barnacles of the genus *Scalpellum* from Irish Seas. *Ann. Mag. Nat. Hist.* (8)7 588-590.

*Scalpellum vulgera* Leach

*Scalpellum (Smillum) kempi* sp. nov.

193. Annandale, Nelson, 1911. *The fauna of British India including Ceylon and Burma, Freshwater sponges, Hydroids & Polyzoa.* Taylor and Francis, London, 1911 viii, 251. pl.v.

Described Freshwater sponges, hydroids & polyzoa of British India including Ceylon and Burma.

FRESHWATER SPONGES

Phylum PORIFERA

Class DEMOSPONGIAE

Order HAPLOSCLERIDA

Family SPONGILLIDAE

Genus 1. *Spongilla* Lamarck

Subgenus *Euspongilla* Vejdovsky

*Spongilla lacustris* Auctorum

*Spongilla lacustris* Subsp. *Reticulata* Annandale

*Spongilla proliferens* Annandale

*Spongilla alba* Carter

*Spongilla alba* var. *cerebellata* Bowerbank  
*Spongilla alba* var. *bengalensis* Annandale  
*Spongilla cinerea* Carter  
*Spongilla travancorica* Annandale  
*Spongilla hemephydatia* Annandale  
*Spongilla crateriformis* (Potts)  
 Subgenus *Eunapius* Gray  
*Spongilla carteri* Carter  
***Spongilla carteri* var. *mollis* nov.**  
***Spongilla carteri* var. *cava* nov**  
*Spongilla fragilis* Leidy  
***Spongilla fragilis* subsp. *Calcuttana* nov.**  
*Spongilla fragilis* subsp. *Decipiens* Weber  
***Spongilla gemina* sp. nov.**  
*Spongilla crassissima* Annandale  
*Spongilla crassissima* var. *crassior* Annandale  
 Subgenus *Stratospongilla* Annandale  
*Spongilla indica* Annandale  
*Spongilla bombayensis* Carter  
***Spongilla bombayensis* var. *pneumatica* nov.**  
*Spongilla ultima* Annandale  
 Genus 2. *Pectispongilla* Annandale  
*Pectispongilla aurea* Annandale  
***Pectispongilla aurea* var. *subspinosa* nov.**  
 Genus 3. *Ephydatia* Lamouroux  
*Ephydatia meyeri* (Carter)  
*Ephydatia fluviatilis* Lamouroux  
 Genus 4. *Dosilia* Gray  
*Dosilia plumose* (Carter)  
 Genus 5. *Trochospongilla* Vejdovsky  
*Trochospongilla latouchiana* Annandale  
*Trochospongilla phillottiana* Annandale  
*Trochospongilla pennsylvanica* (Potts)  
 Genus 6. *Tubella* Carter  
*Tubella vesparioides* Annandale

Genus 7. ***Corvospongilla* nov.**

*Corvospongilla burmanica* (Kirkpatrick)

*Corvospongilla lapidosa* (Annandale)

***Corvospongilla caunteri* sp. nov.**

FRESHWATER POLYPS (HYDRIDA)

Phylum COELENTERATA

Class HYDROZOA

Order ELEUTHEROBLASTEA

Family HYDRIDAE

*Hydra oligactis* Pallas

*Hydra vulgaris* Pallas

*Syncoryne filamentata* Annandale

*Bimeria vestita* Wright

*Irene ceylonensis* Browne

Class ACTINIARIA

*Sagartia schilleriana* Stoliczka

*Sagartia schilleriana* subsp. *Exul* Annandale

FRESHWATER POLYZOA

Class POLYZOA

Subclass ENTOPROCTA

*Loxosomatoides colonialis* Annandale

Subclass ECTOPROCTA

*Membranipora lacroixii* Audouin

*Membranipora bengalensis* Stoliczka

*Bowerbankia caudate* subsp. *bengalensis* Annandale

*Paludicella* sp.

*Victorella bengalensis* Annandale

*Hislopiella lacustris* Carter

***Hislopiella lacustris* subsp. *Moniliformis* nov.**

*Fredericella indica* Annandale

*Plumatella fruticosa* Allman

*Plumatella diffusa* Leidy

*Plumatella allmani* Hancock

*Plumatella emarginata* Allman

*Plumatella javanica* Kroepelin

*Plumatella tanganyikae* Rousselet

*Plumatella punctata* Hancock

*Stolella indica* Annandale

***Stolella himalayana* sp. nov.**

*Lophopodella carteri* (Hyatt)

*Lophopodella carteri* var. *himalayana* Annandale

*Pectinatella burmanica* Annandale

194. Annandale, N. 1911-1912. The occurrence of *Peripatus* on the North-East Frontier of India. *Nature*, **88** 449.

This is an extract from a letter received from Mr. S.W. Kemp, zoologist with the Abor Expedition. *Peripatus* was found under large stones in comparatively dry earth at the height of 3800 ft. at the down slope of Dihang River

195. Annandale, N. 1912. Indian Fresh Water Invertebrates. *Nature*, **88** 511, No. 2207.

A volume was written entirely in India first, with a comment that 'biological research on Indian animals can only be under taken in India'

196. Annandale, N. 1912. Frogs and snakes from the Abor foot-hills. *Nature*, **89** 305, No. 2223.

The collection exhibited forms a very interesting addition to our knowledge of the fauna of the Himalayas, illustrating a district (the eastern extremity of the great range) hitherto almost unknown. Specimens of at least 20 species of frogs, mostly arboreal in habits, were obtained, and of these more than third are new to science. Notably species of the two peculiar Burmese genera *Chirixalus* and *Phrynoderma* are of considerable interest.

197. Annandale, N. 1912. Aged Sea Anemones. *Nature*, **89** . 607.

Dr. J. R. Ashworth and Dr. Annandale's observation on an individual of *Sagartia troglodytes* for a long time shown that the species was in excellent health even after eight years.

198. Annandale, N. 1912. Notes on the Fauna of Paresnath Hill, western Bengal. *Rec. Indian Mus.*, **7** 33-49.

Fauna of Paresnath Hill described in detail.

MOLLUSCS

Family ZONITIDAE

***Ariophanta interrupta* (Bs.) subsp. *sacra* nov.**

*Macrochlamys sacrata* G.A.

*Macrochlamys perplana*, G.A. (Nevill MS.)

*Microcyrtina cryptomphalus* G.A.

*Kaliella barrakporensis* (Pfr.)

Family HEUCIDAE

*Glessula praelustris* (Bs.)

Family CYRENIDAE

*Pisidium* prox. *atkinsomanum* Theob.

EARTHWORMS

*Glyphidrilus annandalei*

*Gordiodrilus* sp.

*Perionyx excavatus*

CRUSTACEA

Family POTAMONIDAE

*Paratelphusa* (*Barytelphusa*) *jaquemontii*, Rthbn.

Family PALAEMONIDAE

*Palaemon* (*Brachycarpus*) sp.

MYRIAPODA and ARACHNIDA

Family SCOLOPENDRIDAE

*Cormocephalus dentipes*, Poc.

Family GALEODIDAE

*Galeodes orientalis*, Stoliczka

INSECTA

ORTHOPTERA

*Mecopoda elongata* (Linn.)

HYMENOPTERA

Family SCOLIIDAE

*Myzine petiolata* Smith

Family POMPILIDAE

*Pseudogenia tinctoria* (Smith)

*Pseudogenia alaris* (Sauss.)

*Salius madraspatanus*.

Family SPHEGIDAE

*Sceliphron violaceum* (Fabr.)

*Sphex umbrosus* Christ.

*Sphex aurulentus* var. *ferrugineus* Lepel

*Cerceris unifasciata* Smith.

Family BUMENIDAE

*Eumenes flavopicta*, Blanch

*Rhynchium brunneum* (Fabr.)

*Rhynchium metallicum* Sauss

*Odynerus bipustulatus* Sauss

Family VESPIDAE

*Icaria ferruginea* (Fabr.)

Family COLLETIDAE

*Prosopis mixta* Smith

*Prosopis strenua* Cam.

Family APIDAE

*Normia westwoodi* Grib.

*Anthophora zonata* Linn.

*Xylocopa amethystina* Fabr.

*Apis dorsata*, Fabr.

Family CHRYSIDIDAE

*Stilbum cyanurum* Forst.

*Chrysis oculata* Fabr.

DIPTERA

Family PSYCHODIDAE

*Phlebotomus major* Annandale

Family TIPULIDAE

*Geranomyia semistriata* Brunetti

Family LEPTIDAE

*Atherix intermedia* Brunetti.

Family BOMBYLIDAE

*Exoprosopa niveiventris* Brunetti

*Argyramoeba distigma* (Wied.)

Acalypterata, subfamily Sepsinae

*Sepsis cynipsea* (Linn.).

COELEOPTERA

*Thysia wallichii* Hope

*Clintesia klugii* (Hopø)

*Clintesia hearsiana* Westw.

**RHYNCHOTA**

*Haphsa nicomache* (Walk.)

**LEPIDOPTERA**

Two species of Microlepidoptera

*Oligophlebia amalleuta*

*Acrocercops convoluta*

List of butterflies caught on Paresnath Hill by Capt. G. H.I. Graham and a native catcher, during the months of April and October, 1908-09

**NYMPHALIDAE**

Subfamily I.

*Danais plexippus*

*Danais chrysippus*

*Danais limniace*

*Euploea core*

*Euploea mulciber*

Subfamily II.

*Mycalesis perseus*

*Mycalesis mineus*

*Mycalesis visala*

*Orsotrioena meda*

*Lethe europa*

*Lethe nilgiriensis*

*Ypthima baldus*

*Ypthima inica*

*Melanitis ismene*

Subfamily IV.

*Charaxes imna*

*Charaxes marmax*

*Charaxes fabius*

*Eulepis athamas*

*Euthalia lubentina*

*Euthalia garuda*

*Euthalia nais*

*Moduza procris*

*Athyma perius*

*Neptis eurynome*

*Neptis columella*  
*Junonia iphita*  
*Junonia lemonias*  
*Junonia orithya*  
*Junonia atlites*  
*Junonia hierta*  
*Junonia almana*  
*Vanessa cardui*  
*Hypolimnna bolina*  
*Hypolimnna misippus*  
*Kallima inachus*  
*Atella phalantha*  
*Argynnis hyperbius*  
*Ergolis ariadne*  
Subfamily V.  
*Telchinia violae*  
Nemeobidae  
*Abisara echerius*  
Papilionidae  
*Papilio aristolochiae*  
*Papilio demoleus*  
*Papilio polymnestor*  
*Papilio polytes*  
*Papilio clytia*  
*Papilio dissimilis*  
*Papilio nomius*  
Pieridae  
*Leptosia xiphia*  
*Delias eucharis*  
*Huphina nerissa*  
*Ixias pyrene*  
*Catopsillia crocale*  
*Catopsillia pyranthe*  
*Catopsillia florella*  
*Terias libythea*  
*Terias hecabe*

FISH

*Glyptosternum saisii*

*Nemachilus savona*

*Discognathus lamta*

*Danio dangila*

*Ophioccephalus gachua.*

REPTILES and BATRACHIA

FROG

*Rana limnocharis*, Wiegman

LIZARDS

*Hemidactylus brookii*, Gray

*Calotes versicolor* (Daud.)

*Charasia blanfordiana*, Stoliczka

*Mabuia çarinata* (Schneid.)

*Lygosoma sikkimense* (Blyth)

199. Annandale, N. 1912. Notes on the distribution of some Indian and Burmese lizards. *Rec. Indian Mus.*, 7 : 90-91.

Distribution of 3 species of Lizards in the Indian Empire,  
Lizards

*Liolepis belliana* Gray

*Mabuia bibronii* (Gray)

*Gymnodactylus peguensis* Blgr.

200. Annandale, N. 1912. Notes on the freshwater sponges. XIV – The generic position of ‘*Spongilla ultima*’ *Rec. Indian Mus.*, 7 : 99.

*Spongilla ultima* was synonymised with *Corvospongilla ultima*

201. Annandale, N. 1912. Fauna Symbiotica Indica. I–Polyzoa attached to Indo-Pacific Stomatopods. *Rec. Indian Mus.*, 7 : 123-126.

Symbiotic Polyzoa attached to Indo-Pacific Stomatopods

*Platypolyzoon* gen. nov

*Platypolyzoon investigatoris* sp. nov.

*Triticella koreni*, G. O. Sars.

202. Annandale, N. and Kemp, Stanley, 1912. Observations on the Invertebrate Fauna of the Kumaon Lakes, with special reference to the sponges and Polyzoa. I –General. *Rec. Indian Mus.*, 7 129-137.

Described the general discussion of Invertebrate Fauna of the Kumaon Lakes, with special reference to the sponges and Polyzoa

POLYZOA

*Lophopodella carteri*

*Fredericella indica*

*Plumatella diffusa*

*Plumatella emarginata*

*Plumatella allmani*

*Plumatella tanganyikae*

***Stolella himalayana* sp. nov.**

PORIFERA

*Spongilla bombayensis*

*Spongilla carteri*

*Spongilla cinerea*

*Spongilla lacustris* subsp. *reticulata*

*Ephydaia fluviatilis*

*Stratospongilla bombayensis* var. *pneumatica*

CRUSTACEA

*Potamon atkinsonianum*

*Pristicephalus priscus*

PERIDINIID

*Ceratium kumaonense* Carter

*Ceratium longicorn*

*Peridinium apiculatum* Ehrenburg.

203. Annandale, N. 1912. Observations on the Invertebrate fauna of the Kumaon Lakes, with special reference to the sponges and Polyzoa. II. Systematic and Geographical notes on the Sponges and Polyzoa. *Rec. Indian Mus.*, 7 137-145.

Described the systematic and geographical notes on the Sponges and Polyzoa of the Kumaon Lakes.

PORIFERA

1. *Spongilla (Euspongiivla) lacustris* subsp. *reticulate*

*Spongilla (Euspongilla) cinerea*, Carter.  
*Spongilla (Eunapius) carteri*, Carter.  
*Spongilla (Stratospongilla) bombayensis*, Carter  
***Ephydatia fluviatilis* subsp, *himalayensis*, nov.**

POLYZOA

*Fredericella indica*, Annandale  
*Peumatella emarginata* Allman  
*Plumatella diffusa* Leidy  
*Plumatella allmani* Hancock  
***Afrindella* subgen nov.**  
*Plumatella (Afrindella) tanganyikae* Rousselet  
*Stolella himalayana* Annandale  
*Lophopodella carteri* (Hyatt)

204. Annandale, N. 1912. Fauna Symbiotica Indica. III – Polyzoa associated with certain Gangetic Tortoises. *Rec. Indian Mus.*, 7 147-150.

Described the Polyzoa associated with certain Gangetic Tortoises.

*Hislopia lacustris* Carter.

***Plumatella (Afrindella) testudinicola* sp. nov.**

205. Annandale, N. 1912. The Indian Mud Turtle (Trionychidae). *Mem. Indian Mus.*, 7 151-180.

**List of the Indian Trionychidae**

*Dogania subplana* (Geoffr.)  
*Trionyx gangeticus* Cuvier  
*Trionyx leithii* Gray  
*Trionyx hurum* Gray  
*Trionyx nigricans*, Anderson  
*Trionyx formosus* Gray.  
*Trionyx phayrei* Theobald  
*Trionyx cartilaginous* (Boddaert)  
*Pelochelys cantoris* (Gray).  
*Chitra indica* (Gray).  
*Emyda granosa* (Schoepff)  
***Emyda granosa intermedia* nov**  
*Emyda granosa vittata* Peters. S

*Emyda granosa ceylonensis* Gray. S

*Emyda granosa scutata* Peters.

206. Annandale, N. 1912. The occurrence of Entoprocta in Indian waters. *Rec. Indian Mus.*, 7 205.

The occurrence of Entoprocta in Indian waters

*Barentsia gracilis*

*Barentsia discreta*

*Loxosomatoides colonialis*

207. Annandale, N. 1912. Fauna Symbiotica Indica. IV – *Caridinicola*, a new type of Tempocephaloidea. *Rec. Indian Mus.*, 7 243-252.

Described the flat worm of Class Tempocephaloidea with a new family, new genus and a new species found attached to antennae of prawns of the genus *Caridina* taken at Cuttack.

**Fam. SCUTARIELLIDAE, nov.**

***Caridinicola* gen. nov.**

***Caridinicola indica* sp. nov.**

208. Annandale, N. 1912. Preliminary description of a freshwater medusa from the Bombay Presidency. *Rec. Indian Mus.*, 7 253-256.

A freshwater medusa discovered from the Yenna and Koyna valleys in the Satara district of the Bombay Presidency.

***Limnocnida indica* sp. nov.**

209. Annandale, N. 1912. The aquatic Chelonia of the Mahanadi and its tributaries. *Rec. Indian Mus.*, 7 261-266.

***Trionyx gangeticus mahanaddicus* subsp. nov.**

*Trionyx leithii* (Gray)

*Emyda granosa intermedia* Annandale

Family Testudinidae The following four tortoises actually known to live in the Mahanadi are described in detail.

Family Trionychidae

*Kachuga tectum intermedia* (Blanford)

210. Annandale, N. 1912. The The freshwater sponges of the Malabar Zones. *Rec. Indian Mus.*, 7 383-397.

The freshwater sponges of the Malabar Zone were described in detail. The collections of S. P. Agharkar of the Elphinstone College,

Bombay, F. H. Gravely of the Indian Museum, R. Shunkara Narayana Pillay of the Trivandrum Museum, and N. Annandale in the Nasik, Poona, Satara and Ratnagiri districts of Bombay and in the Native State of Travancore were studied and described.

List of the Freshwater Sponges of the Malabar Zone.

Genus *Spongilla* Lamarck

Subgenus *Euspongilla* Vejdovsky

*Spongilla. lacustris* subsp. *reticulata*, Annandale

*Spongilla proliferens* Annandale

*Spongilla alba* Carter

*Spongilla cinerea* Carter

*Spongilla travancorica* Annandale

*Spongilla crateriformis* (Potts)

Subgenus *Eunapius* Gray

*Spongilla carteri* Carter

*Spongilla carteri* subsp. *lobosa* Annandale

Subgenus *Stratospongilla* Annandale

***Spongilla gravelyi* nov.**

*Spongilla. indica* Annandale

*Spongilla bombayensis* Carter

Genus *Pectispongilla* Annandale

*Pectispongilla aurea* Annandale

*Pectispongilla aurea* var. *subspinosa* Annandale

Genus *Ephydatia* Lamouroux

*Ephydatia meyeri* (Carter)

Genus *Dosilia* Gray

*Dosilia plumosa* (Carter)

Genus *Trochospongilla* Vejdovsky.

*Trochospongilla pennsylvanica* (Potts)

Genus *Corvospongilla* Annandale

*Corvospongilla caunteri* Annandale

*Corvospongilla ultima* Annandale

***Corvospongilla ultima* var. *spinosa* nov.**

*Corvospongilla burmanica* subsp. *bomhayensis* Annandale

*Corvospongilla lapidosa* Annandale

211. Annandale, N. 1912. Zoological results of the Abor Expedition. 1911-1912. I – Batrachia. *Rec. Indian Mus.*, **8** 7-36.

Kemp's collection of Batrachia from the Abor country and the frontiers of Assam comprises 57 specimens of frogs and toads of the Expedition of 1911—1912. With those included two interesting specimens taken by Mr. Kemp on a visit to the frontier of eastern Bhutan. In all 25 species are represented of which eight were new species.

List of species represented in Mr. Kemp's collection :-

*Rana cyanophlydis* Schneider

*Rana liebigii* Günther

*Rana tigrina* Daud.

*Rana limnocharis* Wiegman.

*Rana alticola* Boulenger.

*Rana granulosa* (Anderson)

*Rana afghana* (Günther)

***Rana gerbillus* sp. nov.**

***Micrixalus borealis* sp. nov.**

*Rhacophorus maximus* Günther

*Rhacophorus bimaculatus* Boulenger.

***Rhacophorus naso* sp. nov.**

***Rhacophorus microdiscus* sp. nov.**

*Rhacophorus maculatus* (Günther)

***Rhacophorus maculatus himalayensis* subsp. nov.**

*Rhacophorus maculatus leucomystax* (Gravenhagen)

*Rhacophorus tuberculatus* Anderson

*Ixalus asper* Boulenger.

*Ixalus annandalei* Boulenger.

***Ixalus argus* sp. nov.**

*Ixalus tuberculatus* Anderson

*Chirixalus doriae* Boulenger.

***Phrynoderma moloch* sp. nov.**

*Bufo melanostictus* Schneider

*Bufo himalayanus* Günther

*Megalophrys* (?) *major*

***Megalophrys kempii* sp. nov.**

212. Annandale, N. 1912. Zoological results of the Abor Expedition, 1911-1912. II. Reptilia. *Mem. Indian Mus.*, **8** 37-59.

The freshwater sponges of the Malabar Zones

*Hemidactylus brookii* Gray

*Hemidactylus platyurus* (Schneider)

*Draco maculatus* Gray

*Ptyctolaemus gularis* Boulenger  
*Acanthosaura minor* (Gray)  
*Calotes versicolor* (Daud.)  
*Calotes jerdonii* Gunth.  
*Ophisaurus gracilis* (Gray)  
*Varanus bengalensis* (Daud.)  
*Tachydromus sexlineatus* Daud.  
*Mabuia macularia* (Blyth)  
*Lygosoma indicum* (Gray)  
***Lygosoma courcyanum*, sp. nov.**

OPHIDIA

*Typhlops diardi* Schleg  
*Typhlops tephrosoma* Wall  
***Typhlops diversiceps* sp. nov.**  
*Trachischium monticola* (Cantor)  
*Blythia reticulate* (Blyth)  
***Aproaspidops antecursorum* gen. nov., sp. nov.**  
*Polydontophis collaris* (Gray)  
*Ablabes porphyraceus* (Cantor)  
***Ablabes pavo* sp. nov.**  
*Ablabes frenatus* (Gunth.)  
*Simotes albocinctus* (Cantor)  
*Oligodon erythrorhachis* Wall  
*Zamenis mucosus* (Linn.)  
*Coluber taeniurus* (Cope)  
*Dendrophis gorei* Wall  
*Pseudoxenodon macrops* (Blyth)  
*Tropidonotus platyceps* Blyth  
*Tropidonotus khasiensis* Boulenger  
*Tropidonotus piscator* (Schneid.)  
*Dipsadomorphus gokool* (Gray)  
*Psammodynastes pulverulentus* (Boie)  
*Dryophis prasinus* Boie  
*Callophis macclellandii* (Reinh.)  
*Amblycephalus monticola* (Cantor)  
*Lachesis monticola* (Gunth.)  
*Lachesis gramineus* (Shaw)

213. Annandale, N. 1912. Zoological results of the Abor Expedition, 1911-1912. Porifera. *Mem. Indian Mus.*, **8** 67.

The collection of the Abor Expedition, 1911-1912 contains only two species of sponges which are described here.

*Spongilla (Euspongilla) proliferens* Annandale

*Spongilla (Eunapius) crassissima* var. *crassior* Annandale

214. Annandale, N. 1912. The Madras Aquarium. *J. Bombay Nat. Hist. Soc.*, **21** 693-694.

A guide on Madras aquarium was published by Dr. J.R.Henderson, the Honorary Director. It is to be mentioned that a number of interesting observations on the habits of fish and marine reptiles that are liable to escape notice unless attention is called to them. On particular red bands of *Lutianus seboe* became faded after being sometime in the aquarium; *Notopterus kapinga* turn black after a few weeks.

215. Annandale, N. 1912. Some recent advances in our knowledge of the freshwater fauna of India (a lecture delivered before the Asiatic Society of Bengal on the evening of March 27<sup>th</sup>). *J. Asiat. Soc. Beng.* (n.s.), **8** 39-53, pls. i-iii.

216. Annandale, N. 1912. The rupture of the egg-shell in the genus *Calotes*. *J. Bombay Nat. Hist. Soc.*, **21** 1099-1100.

Interesting note on the hatching of *Calotes jerdoni* and mine on *Calotes nigrilabris*, so far as the external appearance of the egg just before the young lizard emerges is concerned, my observations agree closely with *Calotes jerdoni* but no trace of egg tooth in *Calotes nigrilabris*.

217. Annandale, N. 1912. Stray Notes on Ceylon animals. *Spolia Zeylanica* VIII, pp. 133-136.

218. Annandale, N. 1912-1913. The Blind Prawn of Galilee. *Nature*. **90** 251.

The name of the eye less prawn of Galilee is *Typhlocaris galilea*. It was found in a small pool near the town of Tiberias communicating with the lake and fed by a mineral spring. There was no trace of colour on the living prawn, except that the internal organs of the thoracic region produced a dusky blotch externally. The whole body was otherwise of a semi-opaque white like that of paffin wax.

219. Annandale, N. 1912-13. Contributions to the biology of the lake of Tiberias. No. 1. An account of the sponges. *Nature*, **90** 508.

The paper is the first in a series based on the visit to Palestine made in October, 1912. With the object of discovering wheather the peculiar fauna characteristic of fresh water in tropical Africa and Asia, especially as regard the lower invertebrates extends northwards up the Jordan valley. Considered as a whole the sponge fauna of the lake provides evidence (1) that a peculiar fauna of closely related species is being evolved their in; (2) that in this lake, as in others, there is a tendency for the Spongillidaeto lose there characteristic gemmules; and (3) that as the gemmules disappear the skeleton of the sponges becomes harder and more compact.

220. Annandale, N. 1913. The Tortoises of Chota Nagpur. *Rec. Indian Mus.*, **9** 63-78.

The Chelonia, and more particularly the terrestrial tortoises of Chota Nagpur, have considerable interest of a geographical kind, for they appear to differ from those of the Ganges valley and to resemble those of northern Assam. The collection of Indian Chelonia in the Indian Museum, brought together largely by the exertions of Blyth, Theobald and John Anderson, is very much more nearly complete than any collection elsewhere. Six species and three races of Tortoises of Chota Nagpur are described here.

Family TESTUDINIDAE.

Genus *Geoemyda* Gray

*Geoemyda trijuga* (Schweigg.)

Form *typica*

Race *thermalis* (Lesson).

Race *coronata* (Anderson).

Race *edeniana* (Theobald)

*Geoemyda trijuga madraspatana* (Anderson)

*Geoemyda indopeninsularis* sp. nov.

*Geoemyda tricarinata* Blyth

Genus *Testudo* Linn.

*Testudo parallelus* sp. nov.

Family TRIONYCHIDAE.

*Emyda granosa intermedia* Annandale.

221. Annandale, N. 1913. Description of a new Sand-boa from the Persian Gulf. *Rec. Indian Mus.*, **9** 217-218.

Capt. R. E. Lloyd, I. M.S., while Surgeon-Naturalist to the Indian Marine Survey, obtained a single specimen of an undescribed *Eryx* has been described.

***Eryx fodiens* sp. nov.**

222. Annandale, N. 1913. The Indian barnacles of the sub-genus *Scalpellum*. *Rec. Indian Mus.*, 9 227-236.

To the sub-genus *Scalpellum* 12 Indian species are described here and their description and key to the species are incorporated here.

*Scalpellum alcockianum* Annandale

*Scalpellum velutinum* Hoek

*Scalpellum trapezoideum* Hoek

*Scalpellum pacificum* Pilsbry

*Scalpellum novae-zelandiae* Hoek

*Scalpellum woodmasoni* Annandale

*Scalpellum albatrossianum* Pilsbry

*Scalpellum gruvelii* Annandale

*Scalpellum curiosum* Hoek

*Scalpellum lambda* Annandale

***Scalpellum longius* sp. nov**

*Scalpellum. laccadivicum* Annandale

223. Annandale, N. 1913. Notes on Freshwater Sponges XV. *Rec. Indian Mus.*, 9 237-240.

Sponges from shells of the genus *Aetheria* (Freshwater Oysters).

***Spongilla (Eunapius) aetheriae* sp. nov.**

***Corvospongilla scabrispiculis* sp. nov.**

224. Annandale, N. 1913. Adaptation in the habits of a Tabanid Fly. *Rec. Indian Mus.*, 9 245-246.

Adaptation in the habits of a Tabanid Fly *Haematopota littoralis* is described here.

225. Annandale, N. 1913. Indian Blood-sucking Midges. *Rec. Indian Mus.*, 9 246-247.

Indian Blood-Sucking Midges of the subfamily Culicoidinae or Ceratopogoninae of the family Chironomidae or Tendipedidae, the number of blood-sucking midges for which the habit has been authenticated in India belong to the genus *Culicoides*.

*Culicoides molestus*

*Culicoides oxystoma*  
*Culicoides himalayae*  
*Culicoides peregrinus*

226. Annandale, N. 1913. Some new and interesting Batrachia and lizards from India, Ceylon and Borneo. *Rec. Indian Mus.*, **9** : 301-307.

The species described or commented on in this paper are represented by specimens presented to the Indian Museum or collected by members of its staff.

**BATRACHIA**

Fam. CAECILIIDAE

*Uraeotyphlus menoni* sp. nov.

*Uraeotyphlus oxyurus* D. & B

*Herpele fulleri* Alcock

Fam. BUFONIDAE

*Bufo stomaticus* Lutken

Fam. RANIDAE.

*Ixalus leucorhinus* Martens

*Ixalus variabilis* Gunther

*Ixalus signatus* Boulenger

*Ixalus cincrascens* Stoliczka

*Ixalus chalazodes* Gunther

*Ixalus glandulosus* Jerdon

*Ixalus annandalei* Boulenger

*Ixalus semiruber* sp. nov.

**LACERTILIA**

Fam. GECKONIDAE

*Alsophylax himalayensis* sp. nov.

*Gehyra beebei* sp. nov.

227. Annandale, N. 1913. The Indian Geckos of the genus *Gymnodactylus*. *Rec. Indian Mus.*, **9** 309-326.

Twenty three species of the Indian Geckos of the genus *Gymnodactylus* so far recorded are described.

*Gymnodactylus montium-salsorum* sp. nov.

*Gymnodactylus scaber* (Ruppel)

*Gymnodactylus brevipes* Blanford

*Gymnodactylus kachhensis* Stoliczka  
*Gymnodactylus stoliczkai* Steindachner  
*Gymnodactylus lawderanus* Stoliczka  
***Gymnodactylus gubernatoris* sp. nov.**  
*Gymnodactylus rubidus* (Blyth)  
*Gymnodactylus himalayicus* Annandale.  
*Gymnodactylus khasiensis* (Jerdon)  
*Gymnodactylus oldhamii* Theobald  
*Gymnodactylus triedrus* Guinther  
*Gymnodactylus jeyporensis* Beddome  
*Gymnodactylus nebulosus* Beddome  
*Gymnodactylus deccanensis* Guinther  
*Gymnodactylus albofasciatus* Boulenger  
*Gymnodactylus peguensis* Boulenger  
*Gymnodactylus consobrinoides* Annandale  
*Gymnodactylus fasciolatus* (Blyth)  
*Gymnodactylus frenatus* Gunther  
*Gymnodactylus pulchellus* (Gray)  
*Gymnodactylus variegatus* (Blyth)  
*Gymnodactylus feae* Boulenger

228. Annandale, N. 1913. Notes on Fishes, Batrachia and Reptiles of the Lake of Tiberias. I. Fishes. *J. Asiat. Soc. Bengal* (n.s.), 9 31-39.
229. Annandale, N. 1913. The Leeches of the Lake of Tiberias. *J. Asiat. Soc. Bengal* (n.s.), 9 211-214.
230. Annandale, N. 1913. *The Indian barnacles of the subgenus Scalpellum*. Pub. Taylor and Francis, London.
231. Annandale, N. 1913, 1916j. A report on the biology of the Lake of Tiberias. I-V. *Indian Museum*, Calcutta.
232. Annandale, Nelson, 1913. Introduction to a report on the biology of the Lake of Tiberias. *Journ. Asiatic Soc. Bengal*, (n.s.), 9 17-23, pl. i.
233. Annandale, N. 1913. Notes on the Fishes, Batrachia and Reptiles of the Lake of Tiberias. II. Batrachia and Reptiles. *J. Asiat. Soc. Bengal* (n.s.), 9 39-41.

234. Annandale, N. 1913. An account of the sponges of the Lake of Tiberias, with observations on certain genera of Spongillidae. *J. As. Soc. Beng.* (n.s.), IX 57-88, pls. ii-v.
235. Annandale, N. 1913. Note on a sponge larva from the lake Tiberias. *J. Asiat. Soc. Beng.* (n.s.), 9 221-222, pl. vii.
236. Annandale, N. 1913. The Polyzoa of the Lake of Tiberias. *J. Asiat. Soc. Bengal* (n.s.), 9 223-228, pl. vii
237. Annandale, N. & Gravely. 1913. The Limestone caves of Burma and the Malay Peninsula. Part II. The fauna of caves. *J. Asiat. Soc. Beng.* (n.s.), IX 402-424, pls. xviii-xxii.
238. Annandale, N. & Kemp, S. 1913. The Crustacea Decapoda of the Lake of Tiberias. *J. Asiat. Soc. Bengal* (n.s.), 9 241-258, pls. xii-xiv.
239. Annandale, N. 1913. Notes on some sponges from Lake Baikal in the collection of the Imperial Academy of Sciences. St. Petersburg. *Ann. Mus. Zool. Ac. Sci., St. Petersburg*, 18 96-101.
240. Annandale, N. 1914. Further notes on the Sponges of Lake Baikal. *Rec. Indian Mus.*, 10 137-148.

Sponges of Lake Baikal, their systematic and geographical distribution of marine as well as freshwater forms.

Family HAPLOSCLERIDAE

Subfamily CHALININKZ

Genus *Lubomirskia* Dybowski

*Lubomirskia baicalensis* (Pallas)

*Lubomirskia abietina* (Swartschevski)

Subfamily RENIERINAE.

**Baikalospongia, gen. nov.**

Type-species : *Lubomirskia bacillifera* Dybowski

The following species from Lake Baikal are assigned to the genus *Baikalospongia*

*Lubomirskia bacillifera*

*Lubomirskia papyracea*

*Lubomirskia intermedia*, Dybowski,

*Lubomirskia tscherskii*

*Lubomirskia fusifera*

*Lubomirskia baikalensis* var. *e*, Soukatschoff

*Lubomirskia irregularis* Swartschevski

All these sponges are so far as is known, found only in Lake Baikal.

241. Annandale, N. 1914. Fauna Symbiotica Indica V. Some sponges commonly associated with Oysters and Mussels in Madras Harbour and the Chilka lake. *Rec. Indian Mus.*, **10** 149-158.

The sponges described in this paper all occur commonly on living shells of *Ostrea* and *Mytilus* either in the harbour of Madras or in lagoons of brackish water on the east coast of India.

The list of the encrusting sponges found on the mussel-shells is as follows :

Family DESMACIODONIDAE

*Mycale aegagropila* (Johnston) var. *militaris* nov.

*Mycale mytilorum* sp. nov.

*Mycale madraspatana* sp. nov.

*Lissodendoryx balanophilus* sp. nov.

*Suberites aquae-dulcioris* sp. nov.

242. Annandale, N. 1914. New and interesting Pedunculate Cirripedes from Indian Seas. *Rec. Indian Mus.*, **10** 273-280.

Annandale described or noticed together with a species of which specimens have been obtained by Mr. J. Hornell off the coast of Baluchistan during the expedition of "Investigator"

Family SCALPELLIDAE

*Scalpellum (Smilium) kampeni* Annandale

*Scalpellum (Smilium) rostratum* Darwin

*Scalpellum (Smilium) sinense* Annandale

*Lithotrya (Conchotrya) valentiana* (Gray)

Family LEPADIDAE

Subfamily OXYNASPIDINAE

*Oxynaspis indica* Annandale

Subfamily LEPADINAE

*Alepas investigatoris* sp. nov.

*Heteralepas (Paralepas) reticulata* sp. nov.

243. Annandale, N. 1914. Three rare Himalayan Lizards. *Rec. Indian Mus.*, **10** 319-320.

Three rare lizards from the western Himalayas deposited to the Indian Museum described are.

*Alsophylax himalayensis* Annandale

*Gymnodactylus lauderanus* Stoliczka

*Acanthosaura major* (Jerdon)

244. Annandale, N. 1914. Zoological results of the Abor Expedition, 1911-1912. XXVII. Reptilia (Supplement). *Rec. Indian Mus.*, **8** 357-358.

In a small collection of lizards and snakes made in the Abor Expedition, 1911-1912 after the conclusion of the main expedition by Capt. Sir George Duff-Sutherland-Dunbar, and presented by him to the Indian Museum the following species are represented which are described here.

LIZARDS

*Japalura andersoniana* Annandale

*Ophisaurus gracilis* (Gray)

SNAKES

*Trachischium monticola* (Cant.)

*Callophis maclellandii* (Reinh.)

245. Annandale, Nelson, 1914. Spongillidae. In : Beitr. Kenntnis Land u. Susswasserfauna Deutsch-Sudwestafrikas, herausgeg, von W. Michaelsen), Hamburg, Lfg. **2** 235-249, pl. vi.
246. Annandale, N. 1914. The African element in the freshwater Fauna of British India, IX *Cong. Inter. Zool. Monaco (publ. Rennes)*, 579-589.
247. Annandale, N. 1915. The distribution and origin of the fauna of the Jordan system with special reference to that of the Lake of Tiberias. *J. As. Soc. Beng. (n.s.)*, **XI** 437-476.

List of aquatic fauna of the Tiberian Basin

PORIFERA

*Ephydatia fluviatilis syriaca*

*Nudospongilla reversa*

*Nudospongilla mappa*

*Nudospongilla aster*

COELENTERATA

*Hydra viridis*

## TURBELLARIA

*Planaria tiberiensis*

*Planaria salina*

*Planaria barroisi*

## ROTATORIA

*Branchionus patulus*

*Branchionus capsuliflorus*

*Asplanchnopus syrinx*

*Synchaeta oblonga*

*Keratella quadrata*

*Keratella cochlearis*

*Conochiloides dossuarius*

## HIRUDINEA

*Placobdella catenigera*

*Herpobdella (Dina) lineate concolor*

## OLIGOCHAETA

*Criodrilus lacuum*

*Helodrilus (Dendrobaena) lacustris*

*Helodrilus (Dendrobaena) byblicus*

## POLYZOA

*Fredericella sultana jordanica*

*Plumatella auricomis*

## HYDRACHNIDA

*Atax crassipex*

*Hygrobates longipalpis*

## OSTRACODA

*Limnocythere tiberiadis*

## COPEPODA

*Cyclops leuckarti*

*Cyclops serrulatus*

*Cyclops macrurus*

*Cyclopsvaricans*

*Ectinosoma barroisi*

*Laophonte mahammed*

*Canthocamptus hibernicus var. incertus*

*Diaptomus salinus*

**CLADOCERA**

*Diaphanosoma brachyurum*  
*Daphnia lumholtzi*  
*Daphnia magna*  
*Monia Brachiata*  
*Ceriodaphnia rigaudi*  
*Ceriodaphnia reticulate*  
*Bosmina longirostris*  
*Bosmina longirostris* var. *comuta*  
*Macrothrix laticornis*  
*Alona cambouei*  
*Alona affinis*  
*Chydorus sphaericus*

**CONCHOSTRACA**

*Caenestheriella educta*

**AMPHIPODA**

*Gammarus pungens*  
*Gammarus syriacus*  
*Orchestia platensis*

**ISOPODA**

*Asellus coxalis*  
*Philoscia couchii*

**DECAPODA**

*Atyaephyra desmarestii*  
*Typhlocaris galilea*  
*Potamon potamios*

**MOLLUSCA**

**GASTROPODA**

*Lymnaea auricularia*  
*Lymnaea virginea*  
*Physa tiberiadensis*  
*Melania tuberculata*  
*Melania tuberculata* var. *elongate*  
*Melanopsis costata*  
*Melanopsis costata* var. *jordanica*  
*Melanopsis costata* var. *degenerate*

*Melanopsis buccinoidea*  
*Melanopsis praerosa*  
*Pyrgula barroisi*  
*Bithinia badiella*  
*Bithinia gennesaretensis*  
*Bithinia semakhensis*  
*Bithinella contempt*  
*Bithinella annandelei*  
*Bithinella syngenes*  
*Bithinella galilaeae*  
*Bithinellavexillum*  
*Valvata saulcyi*  
*Theodoxis jordani*  
*Theodoxis bellardi*  
*Theodoxis bellardi* var. *michoni*

#### LAMELLIBRANCHIATA

*Unio requieni*  
*Unio pietri*  
*Unio tiberianensis*  
*Unio tristrami*  
*Unio terminalis*  
*Unio jordanicus*  
*Unio zabulonicus*  
*Unio prosacrus*  
*Unio littoralis*  
*Unio ellipsoideus*  
*Unio genezarethanus*  
*Unio rothi*  
*Unio simonies*  
*Unio galilaei*  
*Unio raymondi*  
*Unio lorteti*  
*Unio chinnerethensis*  
*Corbicula fluminalis*  
*Corbicula cor*  
*Corbicula crassula*  
*Corbicula syriaca*

*Corbicula filiciani*

**PISCES**

*Blennius varus*

*Blennius lupulus*

*Discognathus lamta rufus*

*Varicorhinus damascinus*

*Varicorhinus syriacus*

*Varicorhinus socialis*

*Varicorhinussauvagei*

*Barbus canis*

*Barbus beddomei*

*Barbus longiceps*

*Leuciscus zaregi*

*Alburnus sellal*

*Nemichilus galilaeus*

*Nemichilus leontinae*

*Clarias macracanthus*

*Cyprinodon ricchardsoni*

*Cyprinodon sophiae*

*Cyprinodon mento*

*Paratilapia sacra*

*Tilapia magdalenae*

*Tilapia zilli*

*Tilapia nilotica*

*Tilapia galilaea*

*Tilapia simonies*

*Tilapia flavi-josephi*

**BATRACHIA**

*Rana esculenta ridibunda*

*Bufo viridis*

*Hyla arborea savignyi*

**REPTILIA**

*Clemmys caspica rivulata*

*Emys orbicularis*

248. Annandale, N. 1915. Indian boring sponges of the family Clionidae. *Rec. Indian Mus.*, **11** 1-24.

Delt with the sponges found in excavations in shells and corals by far the best known are those of the family Clionidae, the species that occur in Indian seas.

Genus *Cliona* Grant

*Cliona celata* Grant

*Cliona vastifica* Hancock

*Cliona carpenteri* Hancock

*Cliona margaritiferae* Dendy

***Cliona annulifera* sp. nov.**

*Cliona mucronata* Sollas

*Cliona ensifera* Sollas

*Cliona viridis* (Schmidt)

*Cliona orientalis* Thiele

***Cliona acustella* sp. nov.**

*Cliona patera* (Hardwicke)

Genus *Thoosa* Hancock

***Thoosa investigatoris* sp. nov.**

*Thoosa armata* Topsent

*Thoosa hancocci* Topsent

***Thoosa laeviaster* sp. nov.**

249. Annandale, N. 1915. The Genus *Austrolella* and some allied species of Phylactolaematous Polyzoa. *Rec. Indian Mus.*, 11 163-169.

Described the genus *Austrolella* in 1910' in a footnote to a paper on Indian Phylactolaemata, but here the type-species as well as other species of the genus *Austrolella* are described. With this some sponges and Hydrozoa are also described.

Genus *Austrolella* Annandale

***Austrolella indica* sp. nov.**

*Austrolella lendenfeldi* (Ridley)

*Austrolella jheringhi* (Meissner)

Genus *Plumatella* Lamarck

*Plumatella punctata* Hancock

***Plumatella punctata* var. *longigemmis* nov.**

Genus *Stolella* Annandale

*Stolella himalayana* Annandale

*Stolella indica* Annandale

SPONGES

*Spongilla carteri* Carter (Bowerbank)

*Spongilla lacustris* subsp. *reticulata* Annandale

HYDROZOA

*Hydra oligactis* Pallas

250. Annandale, N. 1915. Notes on Freshwater Sponges, No. XVI. The Genus *Pectispongilla* and its allies. *Rec. Indian Mus.*, **11** 171-178.

The genus *Pectispongilla* was described in 1909 (*Rec. Ind. Mus.* III, p. 103). But the genus redefined here with the description of type species as well as other species of the genus.

*Pectispongilla aurea* Annandale

*Pectispongilla stellifera* sp. nov.

*Pectispongilla subspinosa* Annandale

251. Annandale, N. 1915. Notes on some Indian Chelonia. *Rec. Indian Mus.*, **11** 189-195.

The majority of the specimens mentioned in these notes have been sent by Dr J.R. Henderson of the Madras Museum to the Indian Museum with specimens from the Madras Presidency.

Family TRIONYCHIDAE

*Trionyx leithii* Gray

*Trionyx hurum* Gray

Family TESTUDINIDAE

*Testudo travancorica* Boulenger

*Geoemyda trijuga* (Schweigg)

*Geoemyda trijuga* Subsp. *plumbea* nov.

*Geoemyda trijuga* Subsp. *coronata* (Anderson)

*Geoemyda trijuga* Subsp. *thermalis* (Lesson)

*Geoemyda tricarinata* Blyth

*Geoemyda silvatica* Henderson

*Bellia crassicollis* (Gray)

252. Annandale, N. 1915. Herpetological notes and descriptions. *Rec. Indian Mus.*, **11** 341-347.

Following species of Amphibians and reptiles are described in details.

*Trionyx sulcifrons* sp. nov.

*Trionyx leithii* Gray

***Gonatodes bireticulatus* sp. nov.**

*Tropidonotus sancijohannis* Boulenger

***Chirixalus sinus* sp. nov.**

*Ichthyophis glutinosus* var. *tricolor* Annandale

*Ichthyophis monochrous* (Bleeker)

253. Annandale, N. 1915. Some Sponges parasitic on Clionidae with further notes on that family. *Rec. Indian Mus.*, **11** 457-478.

In this paper "On the Clionidae of Indian seas" (*Rec. Ind. Mus.* XI, pp. 1-24) Annandale referred incidentally to other sponges parasitic in their burrows. Here he proposed to give an account of those sponges adding some additional notes on the Indian Clionidae. The systematic position of the different species are considered first, in taxonomic order, detail descriptions of all the species in Part- I and then their biological relationships in Part-II.

Part I. SYSTEMATIC

The following is a list of the species; all belong to the order Tetraxonida :

Grade TETRAXONELLIDA

Family PACHASTRELLIDAE

*Stoeba plicata* var. *simplex* (Carter)

Family STELLETTIDAE

*Stelletta vestigium* Dendy

Grade MONAXONELLIDA

Family EPIPOLASIDAE

*Coppatias penetrans* (Carter)

***Coppatias investigatrix* sp. nov.**

Family CLIONIDAE

*Cliona carpenteri* Hancock

*Cliona mucronata* Sollas

*Cliona quadrata* Hancock

***Cliona kemp* sp. nov.**

*Thoosa hancocki* Topsent

Family DESMACIODONIDAE

Subfamily ECTYONINAE

***Rhahdevemia prolifera* sp. nov.**

Family AXINELUDAE

*Amorphinopsis excavans* Carter

***Amorphinopsis excavans* var. *digitifera* nov**

Family CHONDROSIIDAE

*Chondrilla nucula* Schmidt

*Chondrilla mixta* Schulze

*Chondrilla distincta* Schulze

Part II. BIOLOGY

254. Annandale, N. 1915. Fauna of Chilka Lake, Sponges. *Mem. Indian Mus.*, 5 21-54, 5 pls.

*Spongilla alba* Carter

***Spongilla nana* sp. nov.**

*Cliona vastifica* Hancock

*Suberites sericeus* Thiele

*Laxosuberites aqua-dulcioris* Annandale

***Laxosuberites lacustris* sp. nov.**

***Tetilla dactyloidea* var. *lingua* nov.**

255. Annandale, N. 1915. Fauna of Chilka Lake. The coelenterates of the lake with an account of the Actiniaria of brackish water in the Gangetic Delta. *Mem. Indian Mus.*, 5 65-114.

256. Annandale, N. 1915. Fauna of Chilka Lake. The Polyzoa of the lake and of Brackish water in the Gangetic Delta. *Mem. Indian Mus.*, 5 119-133.

257. Annandale, N. 1915. Fauna of Chilka Lake. Cirripedia. *Mem. Indian Mus.*, 5 135-138.

258. Annandale, N. 1915. Fauna of Chilka Lake. Mammals. *Mem. Indian Mus.*, 5 163-167.

259. Annandale, N. 1915. Fauna of Chilka Lake. Reptiles and Batrachians. *Mem. Indian Mus.*, 5 : 168-174.

260. Annandale, Nelson, 1915. Description a freshwater sponge from the north-west of Siberia. *Meim. l'Acad. imp. sciences St. Petersbourg*, 28, No. 9 1-3.

261. Annandale, N. 1915. A naturalistic view of the Chilka Lake. The Calcutta Review.
262. Annandale, N. 1915. Report on a collection of Phylactolaematous Polyzoa from the Volga Region. *Saratov Trd. Obsc. Jest.*, 7 73-82.
263. Annandale, N. & Kemp, S. 1915. Fauna of Chilka Lake. *Mem. Indian Mus.*, 5 Introduction, 1-20.
264. Annandale, N. & Kemp, S. 1915. Fauna of Chilka Lake. The Echiuroidea of the Lake and of Gangetic Delta. *Mem. Indian Mus.*, 5 55-63.
265. Annandale, N. & Kemp, S. 1915. Fauna of Chilka Lake. Ctenophora. *Mem. Indian Mus.*, 5 115-118.

***Pleurobrachia globosa* Race *bengalensis* nov.**

266. Annandale, N. & Kemp, S. 1915. Aquatic Insects other than Coleoptera with notes on some marginal species (Odonata by F.F.Laidlaw). *Mem. Indian Mus.*, 5 175-189.
267. Annandale, N. & Kemp, S. 1915. Fauna of Chilka Lake. Pub. Indian Museum, Calcutta.

POLYZOA

ECTOPROCTA

CHEILOSTOMATA

*Membranipora bengalensis* Stoliczka

*Membranipora hippopus* Levinsen.

CTENOSTOMATA

*Victorella bengalensis* Annandale (Endemic)

*Bowerbankia caudata* Hincks

*Alcyonidium mytili* Dalyell

ENTROPOCTA

*Loxosomatoides colonialis* Annandale (Endemic)

*Loxosomatoides laevis*

*Barentsia discrete* Busk

CIRRIPEDIA

PEDUNCULATA

*Dichelaspis cor* Aurivillius

OPERCULATA

*Balanus Amphitrite* Dawdin

OLIGOCHAETA

ENCHYTRAEIDAE

*Enchytraeus barkudensis* sp. nov.

MEGASCOLECIDAE

*Pontrodilus bermudensis* Bedd., forma *ephippiger* (Rosa)

GLOSSOSCOLECIDAE

*Criodrilus lacuum* Hoffmstr.

MYCIDACEA

*Rhopalophthalmus egregious* Hansen

*Gastrosaccus muticus* sp. nov.

*Gastrosaccus simulans* sp. nov.

*Macropsis orientalis* Tattersall

*Potamomysis assimilis* Tattersall

MAMMALS, REPTILES AND BATRACHIANS

MAMMALS

*Lutra macrodus* Gray

*Orcaella brevirostris* (Owen)

Reptiles and Batrachians

*Chersydrus granulates*, (Schneider)

*Cerberus rynchops* (Schneider)

*Hydrophis obscurus* Daudin

*Crocodylus palustris* Lesson

*Gavialis gangeticus* (Gmelin)

*Chelone imbricata* (Linnaeus)

*Chelone mydus* (Linnaeus)

*Emyda granosa intermedia* Annandale

*Rana cyanophlyctis* Schneider

CRUSTACEA

STOMATOPODA

*Squilla scorpio*

*Squilla scorpio* var *immaculate*

*Squilla interrupta*

## DECAPODA

*Matuta victor* (Fabricius)

***Ebalia malefactorix* sp. nov.**

***Philyra alcocki* sp. nov.**

## BRACHYGNATHA

***Elamena (Trigonoplax) cimex* sp. nov.**

*Ocypoda macrocera* Milne-Edwards

*Ocypoda platytarsis* Milne-Edwards

*Gelasimus annulipes* Latreille

***Dotilla pertinax* sp. nov.**

*Dortilla clepsydrodactylus* Alcock

*Dortilla myctiroides* Milne-Edwards

***Macrophthalmus gastrodes* sp. nov.**

*Pachygrapsus propinquus* de Man

*Varuna litterata* (Fabricius)

*Camptandrium serdentatum* Stimpson

*Sesarma tetragonum* (Fabricius)

*Sesarma batavicum* Moreira

*Plagusia depressa* sub sp. *tuberculata* Lamarck

*Cardiosoma camifex* (Herbst.)

*Heteropanope indica* de Man

***Leipocten sordidulum* gen. et. Sp. nov.**

*Scylla serrata* (Forsk.)

*Neptunus pelagicus* (Linnaeus)

*Thalamita crenata* (Latreille)

## PAGURIDEA

*Clibanarius padavensis* de Mann

*Clibanarius longitarsis* de Mann

*Clibanarius olivaceus* Henderson

*Diogenes avarus* Heller

*Coenobita rugosus* Milne-Edwards

*Coenobita cavipes* Stimpson

## THALASSINIDEA

*Callianassa (Callichirus) maxima* Milne-Edwards

***Upogebia (Upogebia) heterocheir* sp. nov.**

CARIDEA

*Pontophilus hendersoni* sp. nov.

*Paleomon lamarrei* Milne-Edwards

*Paleomon malcolmsoni* Milne-Edwards

*Paleomon rudis* Heller

*Paleomon scabriculus* Heller

*Leander styliferus* (Milne-Edwards)

*Urocaris indica* sp. nov.

*Periclimenes demani* sp. nov.

*Ogyrides striaticauda* sp. nov.

*Athanus polymorphus* sp. nov.

*Alpheus crassimanus* Heller

*Alpheus malabaricus* Fabricius

*Alpheus paludicola* sp. nov.

*Caridina nilotica* var. *bengalensis* de Mann

*Caridina propinqua* de mann

*Leptochela aculeocaudata* Paulson

PENAEIDEA

*Penaeus carinatus* Dana

*Penaeus indicus* Milne-Edwards

*Penaeopsis monoceros* (Fabricius)

*Penaeopsis affinis* (Milne-Edwards)

*Penaeopsis dobsoni* (Miers)

*Lucifer hansenii* Nobili

268. Annandale, N. & Kemp, S. 1916. Fauna of Chilka Lake. Mollusca, Gastropoda. Revision. *Mem. Indian Mus.*, 5 853-873.

MOLLUSCA : GASTROPODA

Family TROCHIDAE

*Umbonium vestiarius vestiarius* (Linnaeus)

Family Cyclostrematidae

*Tubiola microscopic* (Nevill)

*Tinostoma variegatum* Preston

Family NERITIDAE

*Smaragdia mamilla* sp. nov.

Family RISSOIDAE

*Stenothyra (Gangetica) miliacea* (Nev.)

*Stenothyra minima* (Sowerby)

*Fenella virgata* (Philippi)

Family CERITHIDAE

*Telescopium telescopium* (Linnaeus)

*Potamides (Tympantonus) cingulatus* (Gmelin)

Family PYRAMIDELLIDAE

*Turbonilla rambhaensis* (Preston)

*Pyrgulina humilis* (Preston)

Family NASSIDAE

*Pygmaeonassa orissaensis* (Preston)

*Pygmaeonassa denegabilis* (Preston)

*Nassa (Eione) labecula* Adams

Family MURICIDAE

*Cuma disjuncta* Annandale

Family TORNATINIDAE (= RATUSIDAE)

*Didontoglossa estriata* (Preston)

Family BULLIDAE

*Haminea crocata* Pease

269. Annandale, N. & Kemp, S. 1916. Fauna of Chilka Lake. Mollusca, Gastropoda and Lamellibranchiata. *Mem. Indian Mus.*, 5 327-366, pls. xiv-xvi.

Introduced Shells :

GASTROPODA

NASSIDAE

*Bullina vittata*

STROMBIDAE

*Strombus isabella* LK

VIVIPARIDAE

*Vivipara bengalensis* LK

AMPULLARIDAE

*Ampullaria globosa* Swains

NATICIDAE

*Natica macrochiensis* Gmel

*Natica maculosa* Lam.

LAMELLIBRANCHIATA

VENERIDAE

*Meretrix morphine* LK

*Meroe scripta* Gray

*Meroe chilkaenēnsis* Preston

*Meroe satparaēnsis* Preston

DONACIDAE

*Donax pulchella* Hanley

TELLINIDAE

*Tellina barhampurensis* Preston

Other than introduced shells 73 species of which 31 of gastropods and 42 of Lamellibranchs. The gastropods are distributed among 14 families 19 genera and lamellibranchs among 20 families 25 genera. No less than 28 species, with one genus (*Chilkaia*) - that is to say, about 38% of the total number – appear at present to be endemic in the lake system.

GASTROPODA

TORNATINIDAE

*Tornatina estriata*

BULLIDAE

*Bulla (Haminea) crocata*

NASSIDAE

*Nassa sistroidea*

*Nassa labecula*

*Nassa marrattii*

*Nassa denegabilis*

*Nassa orissaensis*

MURICIDAE

*Thais carinifera*

CERITHIDAE

*Potamides (Tympantonos) fluviatilis*

*Potamides (Telescopium) fuscum*

TURRITELLIDAE

*Vanesia rambhaçnsis*

FOSSARIDAE

*Chilkaia imitatrix*

LITIOPIDAE

*Litiopa (Alaba) kempii*

*Litiopa (Alaba) copiosa*

HYDROBIDAE

*Hydrobia (Belgrandia) myliacea*

*Stenothyra blanfordiana*

*Stenothyra minima*

*Stenothyra chilkaensis*

*Stenothyra orissaensis*

*Stenothyra trigona*

*Stenothyra obesula*

SCALARIIDAE

*Epitonium hamatulae*

PYRAMIDELLIDAE

*Pyrgulina humilis*

*Chrysallida (mormula) ecclesia*

*Chrysallida (mormula) nadiensis*

*Odostomia chilkaensis*

NERITIDAE

*Neritina (Theodoxus) souverbiana*

CYCLOSTREMATIDAE

*Cyclostrema (Tubiola) innocens*

*Tinostoma variegatum*

TROCHIDAE

*Umbonium vestiarium*

*Solariella satparaensis*

LAMELLIBRANCHIATA

OSTREIDAE

*Ostrea virginiana*

*Ostrea cucullata*

*Ostrea lentiginosa*

MYTILIDAE

*Mytilus smaragdinus*

*Modiola undulata*

*Modula striata*

**ARCIDAE**

*Arca (Anadara) granosa*

*Arca (Fossularca) lactea*

**ERYCINIDAE**

*Kellya chilkaensis*

*Kellya mahosaensis*

**GALEOMMIDAE**

*Scintilla chilkaensis*

**CARDIIDAE**

*Cardium (Fulvia) rugatum*

**VENERIDAE**

*Meretrix meretrix*

*Meretrix casta*

*Meretrix ovum*

*Tivela dillwyni*

*Tapes pinguis*

*Tapes ceylonensis*

*Clementia annandalei*

**PETRICOLIDAE**

*Petricola esculpturata*

**UNGULINIDAE**

*Diplodonta satparaensis*

*Diplodonta barhampurensis*

*Diplodonta (Felania) annandalei*

*Diplodonta (Felina) ovalis*

*Diplodonta (Felina) chilkaensis*

**PSAMMOBIIDAE**

*Psammobia mahasaensis*

**SOLENIDAE**

*Solen? Fonesi*

*Solen annandalei*

*Solen kempi*

**MACTRIDAE**

*Standella annandalei*

**MYIDAE**

*Corbula chilkaensis*

PHOLADIDAE

*Martesia striata*

TEREDINIDAE

*Tellina chilkaensis*

*Tellina confuse*

SCROBICULARIIDAE

*Theora opalina*

*Cumingia hinduorum*

CUSPIDARIIDAE

*Cuspidaria annandalei*

LYONSIIDAE

*Lyonsia samal-insulae*

ANATINIDAE

*Anatina granulosa*

*Anatina barkudaensis*

*Anatina barkulensis*

270. Annandale, N. 1916. Three plates to illustrate the Scalpellidae and Iblidae of Indian Seas, with synonymy and notes. *Mem. Indian Mus.*, 6(3) 127-131.

271. Annandale, N. 1916. On the Hydrozoon *Campanulina ceylonensis* (Browne). The systematic position and synonymy of the species. *Rec. Indian Mus.*, 12 49-52.

The medusa of the species was described by Browne in 1905 under the name *Irene ceylonensis*, while the hydroid was discovered by Annandale in 1906. Here Annandale described the species as *Campanulina ceylonensis* (Browne).

272. Annandale, N. 1916. Barnacles from deep-sea telegraph cables in the Malay Archipelago. *Journal of the Straits Branch of the Royal Asiatic Society*, 74 281-302.

273. Annandale, N. 1916. Zoological results of a tour in the Far East. Introduction Polyzoa, Entoprocta and Ctenostomata. *Mem. Asiat. Soc. Beng.*, 6 13-37, pls. 1-2.

274. Annandale, N. 1916. Freshwater sponges from the Tai Hu (Great Lake) of the Kiangsu Province, China. *Jl. N. China Brch. R. Asiat. Soc.*, 47 49-52.

275. Annandale, N. 1916. Preliminary report on the fauna of the Tale' Sap or Inland Sea of Singora. *J. nat. Hist. Soc., Siam*, 2 90-102.
276. Annandale, N. 1916. Three plates to illustrate the Scalpellidae and Iblidae of Indian seas, with synonymy and notes. *Mem. Indian Mus.*, 6 : 127-131, pls.vi-vii.
277. Annandale, N. 1916. Fresh water sponges from the Tai Hu (Great Lake) of the Kiangsu Province, China. *Journal of the North China Branch of the Royal Asiatic Society*, 47 : 49-52.
278. Annandale, N. 1916-22. Zoological results of a tour in the Far East, Asiatic Society of Bengal, Calcutta.
279. Annandale, N. 1916-25. Zoological results of a tour in the Far East Pt.1-10. Asiatic Society of Bengal, Calcutta.
280. Annandale, N. 1916. Zoological Results of a tour in the Far East. The Mollusca of Lake Biwa, Japan. *Mem. As. Soc. Beng.*, 5 39-74, pl. iii.
281. Annandale, N. & Kemp, S. 1916. Fauna of Chilka Lake. Mollusca, Gastropoda and Lamellibranchiata (with an account of the anatomy of the common Solen by E.Ghosh). *Mem. Indian Mus.*, 5 327-374.
282. Annandale, N. & Kawamura, T. 1916. The sponges of Lake Biwa. *J. Coll. Sci. imp. Univ. Tokyo*, 39 1-27.
283. Annandale, N. 1917. A new genus of limbless skinks from an island in the Chilka Lake. *Rec. Indian Mus.*, 13 : 17-21.

The paper dealt with the fauna of Barkuda Island in the Chilka Lake, Orissa with a description of a new genus and species of lizard  
Family SCINCIDAE

**Genus *Barkudia* nov.**

***Barkudia insularis* sp. nov.**

284. Annandale, N. 1917. The occurrence of *Rana pleskii* Gunther, in Kashmir. *Rec. Indian Mus.*, 13 417.

Described the frog *Rana pleskii* Gunther, from Kashmir.

285. Annandale, Nelson, 1917. Zoological results of a tour in the Far East, Introduction *Mem. Asiatic Soc. Bengal*, 6 1-12.
286. Annandale, N. 1917. Zoological results of a tour in the Far East. Batrachia. *Mem. Asiat. Soc. Beng.*, 6 119-155, pls. 5-6.
287. Annandale, N. 1917. Zoological results of a tour in the Far East. Hydrozoa and Ctenophora. *Mem. Asiat. Soc. Beng.*, 6 101-117.
288. Annandale, N. 1917. Zoological results of a tour in the Far East. Part 2. Pub. Asiatic Society of Bengal, Calcutta.
289. Annandale, N. 1917. Report on a collection of reptiles and batrachians from Java. *J. fed. Malay St. Mus.*, 7(3) 107-111.
290. Annandale, Nelson, 1917. A note on the fisheries of the Inle Lake, Southern Shan States. Office of the Supt., Govt. Print., Rangoon, Burma.
291. Annandale, N. & Narayan Rao, C.R. 1917. Indian tadpoles. *J. Proc. Asiat. Soc. Beng.* (n.s.), 13 185-186.
292. Annandale, Nelson; Phillott, Douglas Craven, 1917. Miscellanea ethnographica , Part 3. Weighing apparatus from the Southern Shan States. *Mem. Asiatic Soc. Bengal*, 5 193-205, pls. xiii-xiv.
293. Annandale, N. 1918. *Fauna of Inle'* Pub. Asiatic Society of Bengal, Calcutta.
294. Annandale, N. 1918. Introductory account of the Inle' Lake. *Rec. Indian Mus.*, 14 1-7.

This chapter of the Fauna of Inle Lake Contains the Geography of the lake, structure of the surrounding country and origin and history of the lake.

295. Annandale, N. 1918. Fish and fisheries on the Inle' Lake. *Rec. Indian Mus.*, 14 33-64.

This chapter of the Fauna of Inle Lake Contains Fish and fisheries which includes Introduction, physical and other conditions, geographical relations of the fish of the Inle basin, Intha names of

fish, Systematic description of the collection, fisheries of the lake, licences, fishing boats, fish-traps and baskets, nest, fishing enclosures, hooks and lines, fish-spearing and chief edible fish of the lake.

List of species of fish described :

Family CHAUDHURIIDAE nov.

***Chaudhuria caudata* gen. et sp. nov.**

Family SYMBRANCHIDAE

*Amphipnous cuchia* (Ham. Buch.)

*Monopterus albus* (Zuiew)

Family CLARIIDAE

*Clarias batrachus* (Linn.)

Family CYPRINIDAE

*Lepidocephalus berdmorei* (Blyth)

*Nemachilus brevis* Boulenger

***Nemachilus brunneanus* sp. nov.**

*Discognathus lamta* (Ham. Buch.)

*Cirrhina latia* (Ham, Buch.)

*Barbus sarana caudimarginatus* Blyth

*Barbus schanicus* Boulenger

*Barbus stedmanensis* Boulenger

***Cyprinis carpio intha* subsp. nov.**

***Sawbwa resplendens* gen. et sp. nov.**

***Microrasbora rubescens* gen, et sp. nov.**

***Microrasbora erythromicron* sp. nov,**

***Barilius auropurpureus* sp, nov.**

Family NOTOPTERIDAE

*Notopterus notopterus* (Pallas)

ACANTHOPTERIGII

Family MASTACEMBELIDAE

*Mastacembelus oatesii* Boulenger

*Mastacemhelus caudiocellatus* Boulenger

Family OPHIOCEPHALIDAE

*Ophiocephalus striatus* Bloch

***Ophiocephalus harcourt-butleri* sp. nov.**

In addition to these twenty-two species and races the following fish are known to inhabit the Inle basin.

*Nemackilus botia* (Ham. Buch.)

*Barbus dukai* Day

*Barbus tor* (Ham. Buch.)

*Barbus nigrovittatus* Boulenger

*Barbus stoliczkanus* Day

*Barilius ornatus* Sauvage

*Danio aequipinnatus* (McCl.)

*Ophiocephalus gachua* Ham. Buch.

*Ophiocephalus siamensis* Gunther

296. Annandale, N. 1918. Chelonia and Batrachia of the Inle' Lake. *Rec. Indian Mus.*, 14 67-70.

The fishermen of the Inle Lake recognized two species of Chelonia, those were not not seen by Annandale. He described one new subspecies of Chelonia and four species of Batrachia.

#### CHELONIA

*Cyclemys dhor shanensis* subsp. nov.

#### BATRACHIA

*Rana kuhlii* D. and B.

*Rana limnocharis* Wiegman

*Bufo melanostictus* Schneid

*Megalophrys montana* Kuhl

297. Annandale, N. 1918. Sponges, Hydrozoa and Polyzoa of the Inle' Lake. *Rec. Indian Mus.*, 14 75-80.

The Porifera, Hydrozoa and Polyzoa of the Inle Lake are described here.

#### PORIFERA

*Spongilla lacustris* var. *proliferens* Annandale

*Spongilla fragilis* var. *calcuttana* Annandale

*Ephydatia fluviatilis* var. *intha* var. nov.

#### HYDROZOA

*Hydra vulgaris* Pallas

#### POLYZOA

*Hislopia lacustris* Carter

*Hislopia malayensis* Annandale

298. Annandale, N. 1918. Aquatic Molluscs of the Inle' Lake and connected waters. *Rec. Indian Mus.*, 14 : 103-182.

The paper is based on the collection of Mollusca made in the Inle Lake and the surrounding district by Dr. F. H. Gravely and Annandale in February and March, 1917, which includes Introduction, Systematic, Palaeontological, Geographical and Plasticity and evolutionary aspects.

Part I. SYSTEMATIC

GASTROPODA

Order PULMONATA

Family SUCCINEIDAE

*Succinea indica* Pfeiffer

Family LIMNAEIDAE

*Limnaea andersoniana* Nevill

*Limnaea bowelli* Preston

***Limnaea shanensis* sp. nov.**

***Limnaea mimetica* sp. nov.**

*Limnaea* ? prox. *ovalis* Gray

*Planorbis exustus* Desh

*Planorbis saigonensis* (?), Crosse & Fischer

*Planorbis velifer* sp. nov.

***Planorbis vellifer* var. *cillata*, nov.**

*Planorbis trochoideus* Benson

*Planorbis calathus* Benson

*Planorbis caenosus* Benson

Order PECTINIBRANCHIATA

Suborder TAENIOGLOSSA

Family MELANIIDAE

*Melania tuherculata* (Miiller)

*Melania terebra* Benson

*Melania baccata* (Gould)

***Melania baccata* subsp. *elongata* nov**

*Paludomus omata* Benson

Family HYDROBIIDAE

*Hydrobioides turrita* (Blanford)

*Hydrobioides nassa* (Theobald)

*Hydrobioides nassa* forma *typica*  
***Hydrobioides nassa* subspecies *lacustris* nov.**  
***Hydrobioides nassa* subspecies *distoma* nov**  
***Hydrobioides avarix*, sp. nov**  
***Hydrobioides nana* sp. nov.**  
***Hydrobioides phiscus* sp. nov.**  
***Amnicola alticola* sp. nov.**

Family VIVIPARIDAE

*Vivipara lecythis* (Benson)

**Genus *Taia*, gen. nov.**

*Taia theobaldi* (Kobelt)

*Taia naticoides* (Theobald)

***Taia intermedia* sp. nov.**

***Taia obesa* sp. nov.**

*Taia shanensis* (Kobelt)

***Taia cylindrica* sp. nov.**

***Taia lacustris* sp. nov.**

***Taia analoga* sp. nov.**

***Taia conica* sp. nov.**

***Taia elltoralis* sp. nov.**

***Taia intha* sp. nov.**

Family AMPULLARIIDAE

*Ampuaria winkleyi* Pilsbry

Pelecypoda

Order TETRABRANCHIA

Family UNIONIDAE

***Physunio micropteroides* sp. nov.**

***Physunio ferrugineus* sp. nov.**

Suborder Conchacea

Family CYRENIDAE

*Corbicula noetlingi* v. Martens

*Pisidium casertanum* (Poli)

The remains from cave deposits represent the following species.

Mammalia – *Cervus cldi*

Mollusca – *Mekinia variabilis*

*Taia obesa*

*Taia cylindrica*

*Taia conica*

The shells found in lake deposit were :

*Limnaea* sp. nov.

*Planorbis trochoideus*

*Limnaea shanensis*

*Hydrobioides nassa distoma*

*Taia lacustris*

The superficial deposits of the He-Ho basin were :

*Succinea indica*

*Hydrobioides nassa distoma*

*Livinaea shanensis*

*Amnicola alticola*

*Planorbis saigonensis*

*Taia theobaldi*

*Taia intermedia*

*Taia lacustris*

*Mdania baccata clongata*

*Hydrobinides turrita*

*Corbicula noetlingi*

The following species and subspecies of Fossil and Subfossil Mollusca occur :

*Limnaea* ? sp. nov.

*Limnaea shanensis*

*Planorbis trochoideus*

*Melania variabilis*

*Hydrobioides nassa distoma*

*Taia theobaldi*

*Taia obesa*

*Taia conica*

*Taia cylindrica*

*Taia lacustris*

The subfossil shells were taken in superficial deposits on the He-Ho plain. The following is a list of the species and subspecies :

*Succinea indica*

*Limnaea shanensis*

*Planorbis exustus*

*Planorbis saigonensis*  
*Planorbis trochoideus*  
*Melania tuberculata*  
*Melania haccata elongata*  
*Hydrobioides territa*  
*Hydrobioides nassa distoma*  
*Amnicoli alticola*  
*Taia intermedia*  
*Taia theobaldi*  
*Taia analoga*  
*Corbicula noetlingi*

299. Annandale, N. 1918. The fauna of Inle' lake. Summary of results with a description of a new species of *Taia* from the Chindwin Valley, Upper Burma. *Rec. Indian Mus.*, 14 195-212.

The object of this paper is to summarise what has been said in previous papers in this volume on the biology, the geographical relations and the origin of the fauna of the Inle Lake. General discussion of the Inle Lake is given here.

300. Annandale, N. 1918. Some undescribed tadpoles from the hills of Southern India. *Rec. Indian Mus.*, 15 17-24.

With one exception the tadpoles here described were found in the hills of Cochin, in most cases with young frogs of their species, by Dr. F.H. Gravely and Mr. B. Sundara Raj in September, 1914.

List of tadpoles described in this paper :

*Rana verrucosa* Gunther  
*Rana beddomei* (Gunther)  
*Rana leptodactyla* Boulenger  
*Rana semipalmata* Boulenger  
*Nyctibatrachus pygmaeus* (Gunther)

301. Annandale, N. & Rao, C.R.N. 1918. The tadpoles of the families Ranidae and Bufonidae found in the plains of India. *Rec. Indian Mus.*, 15 25-40.

The following tadpoles of the family Ranidae from South India were described :

Family RANIDAE  
*Oxyglossus lima* Gravenh

*Rana brevipalmata* Peters  
*Rana cyanophlyctis* Schneider  
*Rana hexadactyla* Lesson  
*Rana breviceps* Schneider  
*Rana limnocharis* Weigm  
*Rana tytleri* (Theobald)  
*Rana tigrina* Daudin  
*Rana crassa* Jerdon  
*Rana stemosignata* Murray  
*Rhacophorus maculatus* (Gray)  
*Rhacophorus macnafiis* (Gunther)  
*Rhacophorus malabaricus* Jerdon  
 Family BUFONIDAE  
*Bufo melanostictus* Schneider  
*Bulo fergusonii* Boulenger  
*Bufo microtypanum* Boulenger.  
*Bufo stomaticus* Lutken  
*Bufo viridis* Laur

302. Annandale, N. 1918. Further notes on *rana tigrina* and allied forms. *Rec. Indian Mus.*, 15 59-65.

Following species of *Rana* were discussed :

*Rana tigrina* Daudin  
*Rana crassa* Jerdon  
*Rana rugulosa* Wiegmann  
*Rana cancrivora* Gravenhorst

303. Annandale, N. 1918. Freshwater shells from Mesopotamia. *Rec. Indian Mus.*, 15 159-170.

The shells discussed in this paper were found for the most part in what may be called a subfossil condition.

GASTROPODA

Order PECTINIBRANCHIATA

Family NERITIDAE

*Neritina jordani* Sowerby

Family HYDROBIIDAE

*Bithynia badiella* Parreyss

*Bithinella palmyrae* Dautzenberg

Family MELANIIDAE

*Melania tuberculata* (Muller)

*Melanopsis nodosa* Ferassac

*Melanopsis subtingitana* Nevill, Ms.

Family CERITHIIDAE

*Potamides fluviatilis*

Order PLUMONATA

Family LIMNARIDAE

*Limnaea tenera* (Parreyss)

*Limnaea peregriformis* Locard

*Limnaea subpersica* Locard

Family PLANOEBIDAE

*Planorbis convexiusculus* Hatton

*Bullinus contortus* (Mich.)

PELECYPODA

Family CYRENIDAE

*Corbicula fluminalis* (Muller)

*Corbicula cor* Lk.

Family UNIONIDAE

*Unio calliopsis* (Bourg.)

*Unio tigridis* Bourguignat

*Unio dignatus* var. *semiramidis* Kobelt

*Unio ciconius* (Bourg.)

*Gabillotia euphratica* (Bourguignat)

Family CORBULIDAE

*Corbula (Erodona) mesopotamica* sp. nov

304. Annandale, N. 1918. A primitive eel from the Southern Shan States. *J. Asiat. Soc. Bengal* (n.s.), 14, p. cli.
305. Annandale, N. 1918. Plasticity and evolution among the aquatic molluscs of the Inle' Lake in the southern Shan States. *J. Proc. Asiat. Soc. Beng.* (n.s.), 14 150.
306. Annandale, N. 1918. Zoological results of a tour in the Far East. Sponges. *Mem. Asiat. Soc. Beng.*, 6 193-216, pl. 9.

307. Annandale, N. 1918. Zoological results of a tour in the Far East. Mollusca of the Tai-Hu. *Mem. Asiat. Soc. Beng.*, **6** 299-320, pl. 10.
308. Annandale, N. & Prasad, B. 1918. Note on the taxonomic position of the genus *Camptoceras* Benson and of *Lithotis japonica* Preston (Mollusca Pulmonata). *J. Proc. Asiat. Soc. Beng.*, (n.s.), **14** 457-462, pls. 12.
309. Annandale, N. & Rao, C.R.N. 1918. The tadpoles of the families Ranidae and Bufonidae found in the plains of India. *Rec. Indian Mus.*, **15** 25-40.
310. Annandale, N. 1919. The fauna of certain small streams in the Bombay Presidency. Sponges from the Satara and Poona districts and from Chota (Chuta) Nagpur. *Rec. Indian Mus.*, **16** 156-161, pls. vi, vii.

The paper dealt with :

*Limnea hordeum*

*Limnea truncatul*

*Limnea persica*

*Limnea bactriana*

*Limnea iranica*

*Limnea gedrosian,*

*Limnea gedrosiana* var. *rectilabru,*

*Limnea peregra canalifera*

*Limnea cor* sp. Nov.

*Limnea tenera euphratica.*

311. Annandale, N. 1919. Further note on the burrows of *Solenia soleniformis*. *Rec. Indian Mus.*, **16** 205-206.
312. Annandale, N. 1919. The tadpoles of *Nyctibatrachus pygmaeus* and *Ixalus variabilis* a correction. *Rec. Indian Mus.*, **16** 303.

In "Records of the Indian Museum "(Vol. XV, p. 21, pi. i, figs. 5, 5a) Annandale described and figured a tadpole as *Nyctibatrachus pygmaetis* which is corrected here as larvae of *Ixalus variabilis*.

313. Annandale, N. 1919. Notes on Freshwater sponges. No. XVII. A new race of *Trochospongilla latouchiana* from China. *Rec. Indian Mus.*, **16** 457-458.

Described a freshwater sponges of China

*Trochospongilla latouchiana* subsp. *sinensis* nov.

314. Annandale, N. 1919. Report on the aquatic fauna of seistan. Prefatory Note. *Rec. Indian Mus.*, **18**(1) 1-2.

The series of papers based mainly on the collections made by Mr. S. W. Kemp and Annandale in Seistan and Baluchistan in November, December and January, 1918-19. The main object of the tour was to enquire into the etiology of the disease Bilharziasis or Schistosomiasis, and particularly to discover whether the parasite occurred in Seistan, or whether any known intermediate molluscan host was found to be in that country. So far as it was concerned the results were entirely negative ; but that was the opportunity to make as large and complete a collection of the aquatic fauna of seistan.

315. Annandale, N. 1919. Report on the aquatic fauna of Seistan with subsidiary studies. Geographical Introduction. *Rec. Indian Mus.*, **18** 3-16.

Geographical Introduction :

The paper dealt with Seistan and Helmand River. A summary was provided about the Helmand River System and climate of Seistan and Hamun –I-Helmand as a lake and of an aquatic fauna includes Mayfly larvae *Palingenia*, small fishes etc. The Hamun is ordinarily divided into several distinct basins, of which two may be recognized as of most important and distinct named as Hamun-I-Sabari and the Hamun –i-Koh- Khwaja. The clay of the lakes contain empty shells of *Lamellidens* and *Corbicula*. It deals with the origin of Hamun-i-Helmand, water quality of Seistan.

316. Annandale, N. 1919. Notes on fish of the genus *Discognathus* from India and Persia. *Rec. Indian Mus.*, **18**(1) 65-78.

Described the species of the genus *Discognathus* from India and Persia with their keys.

*Discognathus adiscus* sp. nov.

*Discognathus wanae* Regan

*Discognathus phryne* sp. nov.

*Discognathus imberbis*  
*Discognathus lamta* Day  
*Discognathus gotyla* (Gray and Hardwicke)  
*Discognathus persicus* (Berg.)  
*Discognathus jerdoni* (Day)  
*Discognathus jerdoni* Subsp. *kangrae* Prashad  
*Discognathus stenorhynchus* (Jerdon)  
*Discognathus bicornutus*  
***Discognathus elegans* sp. nov.**  
*Discognathus gravely*  
*Discognathus platycephalus*  
*Discognathus nasutus*  
*Discognathus macrochir*

317. Annandale, N. 1919. Sponges, Hydrozoa and Polyzoa of Seistan. *Rec. Indian Mus.*, 18(2) 83-97.

Specimens of ten species of the groups discussed in this paper were collected in Seistan - five sponges, one Hydrozoon, and four Polyzoa.

PORIFERA

*Spongilla alba* Carter  
***Spongilla alba* var. *rhadinaea* nov.**  
***Spongilla lacustris* var. *ineptorum* nov.**  
*Spongilla (Eunapius) carteri* Carter  
*Ephydatia fluviatilis* auct.

Hydrozoa.

*Hydra vulgaris* Pallas

POLYZOA

*Fredricella sultana* subsp. *jordanica* Annandale  
***Plumatella (Afrindella) persica* sp. nov.**  
***Plumatella (Hyalinella) bigemmis* sp. nov.**  
*Lophopodella carteri* (Hyatt)

318. Annandale, N. 1919. Zoological results of a tour in the Far East. Part 6. Asiatic Society of Bengal, Calcutta.

319. Annandale, N. 1919. The gastropod fauna of old Lake Beds in upper Burma. *Rec. geol. Surv. India*, 50 209-240, pls. 21-33.

320. Annandale, N. 1919g. Mortality among snails and appearance of blue-bottle flies. *Nature*, **104** 412.

Residential area of Municipal Calcutta is free from house-flies (*Musca* spp.) and blue bottle flies. A few miles away from Calcutta the blue bottles (*Pycnonoma* and *Lucilia dux*) are responsible for enteric epidemiasis. These flies are always seen in the dead bodies of *Achatina fulica*, a land snail. The snail was enormously abundant and in fact, it is worth putting on record as illustrating the delicate balance of nature and the danger of introducing apparently harmless or even seemingly beneficial animals into a new country.

321. Annandale, N. 1919. Aquatic fauna of Seistan. *Nature*, **104** 453.

322. Annandale, N. & Prasad, B. 1919. Report on the freshwater Gastropod Molluscs of Lower Mesopotamia. Part I – The genus *Lymnaea*. *Rec. Indian Mus.*, **18**(2) 103-115.

In the report the freshwater Gastropod molluscs of the delta of the Tigris and Euphrates and of the lower reaches of the two rivers are described.

*Limnaea gedrosiana* Annandale and Prashad

*Limnaea bactriana* Hutton

*Limnaea peregra* race *canalifera* Mousson

*Limnaea cor* sp. nov.

*Limnaea tenera* race *euphratica* Mousson

*Limnaea hordeum* Mousson

323. Annandale, N. 1919. The fauna of certain small streams in the Bombay Presidency. *Rec. Indian Mus.*, **16** 109-138.

This paper is based primarily on collection made in the course of tour in the Satara at Poona districts in February and March, 1918. The following chapters are dealt with in this paper.

#### INTRODUCTION

I. The Limnocoela pool in the Yenna river at Medha

Fauna recorded from this pool :

#### PORIFERA

*Corvospongia ultima* var. *spinosa*

*Spongilla perviridis*

*Spongilla sumairensis* var. *rivularis*

**POLYZOA**

*Plmnatella javanica*

*Plmnatella emarginata*

**CNIDARIA**

*Limnocrnida indica*

**PRAWNS**

*Caridina*

*Palaemon*

**CRAB**

*Paratelphusa (Barytelphusa) jacquemonti*

**MOLLUSCA**

*Parreyssia corrugata*

*Parreyssia cylindrica* sp. nov.

**FISH**

*Barilius bendelesis*

*Discognathus lamta*

*Gobius bombayensis*

**II. The Fauna of Mountain Streamlets at Khandalla**

Fauna delt with :

**INSECTS**

*Rhagovelia nigricans*

*Heleocoris elongatus*

*Ptilomera laticaudata*

*Naucoris sordidus*

*Metrocoris stali*

*Erithares templetoni.*

**MOLLUSCS**

*Ampullaria nux*

**FISH**

*Nemachilus etezardi*

*Discognaihus nasutus*

*Psilorhynchus tentaculatus*

**BATRACHIA**

*Rana limnocharis syhadrensis*

*Ixalus bombayensis*

*Rana cyanophlyctis*

III. The Fauna of Damp Rocks at the Edge of Waterfalls at Khandalla

INSECTA

*Pirates arcuatus*

*Hebrus bombayensis*

*Onychotrechus rhexenor*

*Gerris sp.*

MOLLUSCA

*Cremnoconchus syhadrensis*

*Lithotis sp.*

BATRACHIA

*Ixalus bomhayensis*

*Rana limnocharis syhadrensis*

IV. Some Frogs from Streams in the Bombay Presidency

*Rana cyanophlyctis* Schneider

*Rana limnocharis* subsp. *syhadrensis* nov.

*Ixalus bombayensis* sp. nov.

V. Notes on Freshwater fish mostly from the Satara and Poona Districts.

Fish of the following species were collected in the Yenna at Medha :

*Euglyptosternum saisii* (Jenkins)

*Lepidocephalus thermalis* (C. & V.)

*Nemachilus evezardi* Day

*Nemachilus botia* (Ham. Buch.).

*Nemachilus savona* (Ham. Buch.).

*Nemachilus anguilla* sp. nov.

*Psilorhynchus tentaculatus* sp. nov.

*Discognathus lamta* (Ham Buch.)

*Discognathus jerdoni* Day

*Discognathus nasutus* (McClelland)

*Discognathus gravelyi* sp. nov.

*Cirrhina reba* (Ham. Buch.)

*Barbus tor* (Ham. Buch.)

*Barbus mussullah* Sykes

*Barbus putitora* (Ham Buch.)  
*Barbus jerdoni* Day  
*Barbus malabaricus* Jerdon  
*Barbus kolus* Sykes  
*Barbus ticto* Day  
*Rasbora daniconius* (Ham. Buch.)  
*Barilius bendelisis* (Ham Buch)  
*Danio aequipinnatus* (McCl.)  
*Chela boopis* Day  
*Mastacembelus armatus* (Lacep)  
*Ophiocephalus gachua* Ham. Buch.  
***Gobius bombayensis* sp. nov.**

VI. Some Freshwater Molluscs from the Bombay Presidency

Fauna described :

*Limnaea acuminata* Lamarck  
***Limnaea acuminata* var. *nana* nov.**  
*Limnaea chlamys* Benson  
*Limnaea pinguis* Dornh  
*Planorbis cxustus* Desh  
*Planorbis labiatus* Benson  
*Melania tuberculata* (Müller)  
*Melania scabra* (Miiller)  
*Paludomus obesa* (Phillipi)  
*Cremnoconchus syhadrensis* (Blanford)  
*Ampullaria nux* Reeve  
***Parreyssia cylindrica* sp. nov.**  
*Parreyssia corrugata* (Muller)  
*Lamellidens marginalis* var. *cylindrica* (H.& T.)

VII. Aquatic and semiaquatic Rhychota from the Satara and Poona districts

The following species are described :

Family HEBRIDAE

***Hebrus bombayensis* sp. nov.**

Family HYDROMETRIDAE

*Hydrometra vittata* Stal

*Rhagovelia nigricans* (Burm.)

*Onychotrechus rhexenor* Kirk.

*Ptilomera laticaudata* (Hardw.)

*Metrocoris stali* (Dohrn)

Family REDUVIIDAE

*Pirates arcuatus* (Stal)

Family PELOGONIDAE

*Pelogonus marginatus* (Latr.)

Family Nepidae

*Laccotrephes ruber* (Linn.)

*Laccotrephes griscus* (Guer.)

Family NAUCORIDAE

*Heleocoris elongatus* Montand.

*Heleocoris obliquatus* Montand.

*Naucoris sordidus* Dist.

Family NOTONECTIDAE

***Enithares lactea* sp. nov.**

*Enithares templetoni* (Kirby)

Family CORIXIDAE

*Corixa hieroglyphica* Duf.

VIII. Sponges from the Satara and Poona Districts and from Chota (Chutia) Nagpur

Sponges described in this paper :

*Spongilla lacustris* var. *proliferens* Annandale

*Spongilla* (*Euspongilla*) *cinerea* Carter

***Spongilla* (*Euspongilla*) *perviridis* sp. nov.**

*Spongilla crateriformis* Potts

*Spongilla sumatrana* Weber

***Spongilla sumatrana* var. *rivularis* nov.**

***Spongilla sumatrana* var. *centralis* nov.**

*Spongilla carteri* Carter

*Corvospongilla ultima* var. *spinosa* Annandale.

324. Annandale, N. & Prashad, B. 1919. The fauna of certain small streams in the Bombay Presidency. Some freshwater molluscs from the Bombay Presidency. *Rec. Indian Mus.*, **16** 139-152, pls. iv, v.

325. Annandale, N. & Prashad, B. 1919. Some Gastropod Molluscs from the Gangetic Delta. *Rec. Indian Mus.*, 16 241-258, pl.xx.

The molluscs described or discussed in this paper live in the waterways of the Gangetic Delta or lead an amphibious existence on their shores. The present paper dealt with only those Gastropods about which something new to say from a strictly taxonomic point of view. Fauna described as follows :

Family NERITIDAE

*Dostia comucopia* (Benson)

*Dostia depressa* (Benson)

*Dostia platyconcha* sp. nov.

Family LITTORINIDAE

*Littorina melanostoma* Gray

*Littorina subintermedia* Nevill

*Littorina delicatula* Nevill

Family HYDROBIIDAE

*Stenothyra echinata* sp. nov.

*Stenothyra solute* sp. nov.

*Bithinella miliacea* (Nevill)

Family ASSIMINEIDAE

*Assiminea brevicula* (Ptr.)

*Assiminea beddomiana* Nevill

*Assiminea (Cyclotrophis) francesiae* (Gray)

Family MELANIIDAE

*Melania (Mainwaringia) paludomidea* Nevill

Family NASSIDAE

*Nassa ennurensis* Preston

*Nassa ennurensis* var. *depauperata* nov.

Family RINGICULIDAE

*Ringicula caeca* sp. nov.

Family AURICULIDAE

*Auricula translucens* sp. nov.

326. Annandale, N. & Prasad, B. 1919. Contributions to the Fauna of Yunnan based on collections made by J. Coggin Brown, B.Sc., 1909-10. Part IX. – Two remarkable genera of freshwater Gastropod Molluscs from the Lake Erh-Hai. *Rec. Indian Mus.*, 16 413-423.

Collection of molluscs made by Mr. J. Coggin Brown of the Geological Survey of India in Yunnan, numerous specimens of two species find a place among the Pleuroceratidae more conveniently than elsewhere. The two species are described here.

*Fenouilia kreitneri* (Neumayr)

***Paraprososthenia (Parapyrgula) coggini* sp. nov.**

327. Annandale, N., Prasad, B. & Kemp, S.W. 1919. The Mollusca of the Inland waters of Baluchistan and of Seistan, with a note on the Liver-fluke of sheep in Seistan. *Rec. Indian Mus.*, 18(1) 17-62.

In studying the aquatic Mollusca of Seistan they found it necessary to study also those of Baluchistan, from certain parts of which abundant material was available. The following is a list of the species and varieties arranged according to the classification set forth by Pelseneer in Lankester's Treatise on Zoology, Vol. V (1906).

Systematic Account of the Fauna described.

Class GASTROPODA

Fam. HYDROBIIDAE

Genus *Amnicola* Gould and Haldeman

**Subgenus *Alocinma* nov.**

***Amnicola (Alocinma) sistanica* sp. nov.**

*Amnicola parvula* (Hutton)

Family VIVIPARIDAE

Genus *Vivipara*, Montfort.

*Vivipara hilmendensis* Kobelt

Family MELANIIDAE

*Melanoides* Olivier

*Melanoides tuberculata* (Muller)

*Melanoides pyramis* (Hutton)

***Melanoides pyramis* var. *leopardina* nov.**

***Melanoides pyramis* var. *puteicola* nov.**

*Melanoides pyramis* var. *flavida* (Nevill)

*Melanoides pyramis* var. *luteomarginata* (Nevill)

*Melanoides tigrina* (Hutton)

*Melanoides scabra* (Muller) var. *elegans* (Hutton)

Genus *Melanopsis* Ferussac

***Melanopsis deserticola* sp. nov.**

Family LIMNAEIDAE

Genus *Limnaea* Lamarck

*Limnaea persica* Issel

*Limnaea iranica* sp. nov.

*Limnaea bactriana* Hutton

*Limnaea gedrosiana* sp. nov.

*Limnaea gedrosiana* var. *rectilabrum* nov.

*Limnaea truncatula* Gray

*Limnaea hordeum* Mousson

Family PLANORBIDAE

Genus *Gyraulus* Agassiz

*Gyraulus convexiusculus* (Hutton)

*Gyraulus euphraticus* Mousson

Genus *Segmentina* Fleming

*Segmentina calathus* (Benson)

Class LAMELLIBRANCHIA

Family CYRENIDAE.

Genus *Corbicula* Megerb

*Corbicula fluminalis* (Muller)

Family UNIONIDAE.

Genus *Lamellidens* Simpson

*Lamellidens marginalis* Subsp. *rhadinaeus* nov.

328. Annandale, Nelson and Asiatic Society of Bengal, 1919. Zoological results of a tour in the Far East. The Molluscs of Lake Biwa, Japan. *Mem. Asiatic Society of Bengal*, 6 39-74.
329. Annandale, N. 1919-20. The Fauna of Inlé Lake. *Nature*, 104 : 176-177.

Summary of the Fauna of Inle Lake published in *Rec. Indian Mus.*, vol. 14. (1918).

330. Annandale, N. 1920. Report on the freshwater Gastropod Molluscs of Lower Mesopotamia. Part II. – The Family Planorbidae. *Rec. Indian Mus.*, 18(3) 147-149.

Four species of this family from lower Mesopotamia, three belonging to the genus *Gyraulus*, one to *Bullinus* are described.

Family PLANORBIDAE

Subfamily PLANORBINAE

Genus *Gyraulus* Agassiz  
*Gyraulus euphraticus* (Mousson)  
*Gyraulus convexiusculus* (Hutton)  
*Gyraulus intermixtus* (Mousson)  
Subfamily BULLININAE  
Genus *Bullinus* Adanson  
*Bullinus contortus* (Michaud)

331. Annandale, N. and Hora, S.L. 1920. The fish of seistan. *Rec. Indian Mus.*, 18(4) 151-191.

All the fish in the fauna of Seistan belong to the suborder Cyprinoidea and to the families Cyprinidae and Cobitidae.

Family CYPRINIDAE

Subfamily CYPRININAE

*Scaphiodon macmahoni* Regan

*Discognathus adiscus* Annandale

*Discognathus phryne* Annandale

Subfamily SCHIZORHORACINAE

*Schizothorax zarudnyi* (Nikolsky)

*Schizopygopsis stoliczkae* Steind

*Schizocypris brucei* Regan

Family COBITIDAE

*Nemachilus stoliczkae* (Steindachner)

*Adiposia macmahoni* (Chaudhuri)

*Adiposia rhadinaea* (Regan)

332. Annandale, N. 1920. Appendix. Note on the fisheries of the delta of the helmand and on the use of shaped rafts of bulrushes in India and Seistan. *Rec. Indian Mus.*, 18(4) 192-203.

This paper dealt with the fisheries, fishing crafts and gears, fishing nets and etc. used in India and Seistan.

333. Annandale, N. 1920. Indian freshwater molluscs assigned to the genus *Bithynia*. *Rec. Indian Mus.*, 19 41-46.

In Mr. H. B. Preston's volume on the Freshwater Molluscs in the Fauna of British India series, eighteen species are assigned to the genus *Bithynia*, Leach and several allied forms have since been described from Burma and Assam. All of these (22 species)

Annandale examined, placed them in five distinct genera assign them to their proper genera and sub-genera, and described a new genus and a new subgenus.

Subfamily BITHYNIINAE

Genus *Amnicola* Gould and Haldeman (1841)

Subgenus *Alocinma* Annand, and Prashad (1919)

Genus *Bithynia* Lychach (1818)

Genus *Hydrobioides* Blanford (1869)

Subgenus *Hydrobiaides*

Subgenus *Paranerita* nov.

Genus *Sataria* nov.

Subfamily MYSORELLINAE nov.

Genus *Mysorella* Godwin-Austen (1919)

334. Annandale, N. 1920. Materials for a generic revision of the freshwater Gastropod Molluscs of the Indian Empire, No. I. The Indian Genera of Melaniinae. *Rec. Indian Mus.*, 19 107-110.

Genera described with key :

Genus *Melanoides* Olivier

Genus *Acrostoma* Brot.

Genus *Melania* Lamarck

335. Annandale, N. 1920. Materials for a generic revision of the freshwater Gastropod Molluscs of the Indian Empire, No. II. The Indian Genera of Viviparidae. *Rec. Indian Mus.*, 19 : 111-116.

Genera described with key :

Genus *Vivipara* Montfort

Genus *Lecythoconcha* nov.

Genus *Taia* Annandale

*Temnotaia* Annandale (1919)

336. Annandale, N. & Prasad, B. 1920. Further notes on the genus *Camptoceras* (Mollusca Pulmonata). *J. Proc. Asiat. Soc. Beng.* (n.s.), 16 27-33.

*Camptoceras hirasei*

*Camptoceras subspinosus* sp. nov.

Key to the species of *Camptoceras* (4 species)

*Camptoceras austeni*, *Camptoceras hirasei*, *Camptoceras terebra*,  
*Camptoceras lineatum*, *Camptoceras subspinosum*

337. Annandale, N. 1920. Opening address in a discussion on value of bodily measurements in distinguishing human races. *J. Proc. Asiat. Soc. Beng.* (n.s.), **16** 41-56, pls. 3-6. (Proc. 7<sup>th</sup> Indian Sci. Congr.).
338. Annandale, N. 1920. The geographical distribution of the freshwater gastropod molluscs of the Indian Empire and its direct bearing on that of human disease. *J. Proc. Asiat. Soc. Beng.*, **16** 148 (Abstr). [Det. Paper *Indian J. med. Res.* (Spl. Congr. Number) 35-37].
339. Annandale, N. 1920. The apple-snails of Siam. *J. nat. Hist. Soc. Siam*, **4** 1-24, pls. 1-2.
340. Annandale, N. 1920. The apple-snail of Siam. *J. nat. Hist. Soc. Siam*, **4** 45.
341. Annandale, N. 1920. Observations on *Physa prinsepilii* Sowerby and on a clionid sponge that burrowed in its shell. *Rec. geol. Surv. India*, **51** 50-64, pls. 4-5.
342. Annandale, N. & Prasad, B. 1920. Observations on a carnivorous land snail. *Rec. Indian Mus.*, **19** 189-194.

In the genus *Ennea* H. and A. Adams, there are at present included a number of species which differ greatly in the complexity of the armature of the mouth of the shell. The species are :

*Ennea bicolor* (Hutton).

*Ennea bicolor* race *barkudcnsis* nov.

343. Annandale, N. & Sewell, R.B.S. 1920. Progress report on a survey of the freshwater gastropod mollusks of the Indian Empire and of their trematode parasites. Part I. *Indian J. Med. Res.*, **8** 93-117.
344. Annandale, N. & Amin-ud-Din, 1920. Note on the occurrence of the Leech *Lymnatis nilotica* in Seistan and the Afgan-Baluch Desert. *Rec. Indian Mus.*, **18**(3) 135-136.

Numerous instances of the leech *Limnатыtis nilotica* causing haemorrhage in the throat of men and beasts when swallowed. This is the first record of occurrence of the Leech *Lymnатыtis nilotica* in Seistan and the Afgan-Baluch Desert

345. Annandale, N. 1921. Notes on Larval Trematodes from Seistan. Addendum. *Rec. Indian Mus.*, **18** 232-233.
346. Annandale, N. 1921. Indian fossil Viviparidae. *Rec. geol. Surv. India*, **51** 362-367.
347. Annandale, N. 1921. The fauna of Asiatic Lakes. *J. Proc. Asiat. Soc. Beng.*, **16** 81-83 (Proc. 7<sup>th</sup> Indian Sci. Congr.).
348. Annandale, N. 1921. Societies and Academies Linnean Society. *Nature*, **107** 574.

The vegetation of an island in the Chilka Lake. The area of the island is about 1/3<sup>rd</sup> of the square mile, and the rocks are composed of garnet-bearing quartzite which yields an infertile and scanty soil on weathering. The climate is relatively dry. The vegetation consists mainly of trees, shrubs and perennial creepers with a great scarcity of herbs, ferns and epiphytes and a complete absence of palms, bamboos, screw –pines and orchid.

349. Annandale, N. 1921. The fauna of Scottish Lochs. *Nature*, **107** 778.

*Pisidium clessini*

In Lake Biwa in Japan, the Palaearctic *P.casertanum* is found only at considerable depths and it is probable that in Scotland *P.Clessiin* lives still deeper.

350. Annandale, N. 1921. Indian Land Mollusca. *Nature*, **108** 180.

“In Lt.-Col. Godwin-Austin's instructive review of the latest volume in the official ‘Fauna of India’ (NATURE, sept.22.pg 106) he rightly lays stress on the importance of preliminary work in the preparation of what are supposed to be authentic hand books. May I state that on hearing, I wrote offering the material on loan belongs to the Indian Museum including Nevill's Type specimens. But it was ignored. I make this statement because I find that it is commonly believed that the Zoological Survey of India, of which I have the honour to be Director, is in same way responsible for the ‘Fauna of British India’ This is not the actual case”

351. Annandale, N. 1921. Indian Land Mollusca. *Nature*, **108** 340.  
 The volume of Indian Mollusca by Gude was not included the collection of Indian Museum.
352. Annandale, N. & Hora, S.L. 1921. The Fish of Seistan. *Proc. Seventh Indian Science Congr.*, p. 83.
353. Annandale, N. 1921. The fossil *Physa prinsepilii*, Sowerby considered as a mollusc. *J. Proc. Asiat. Soc. Beng.*, **16** 135 (Proc. 7<sup>th</sup> Indian Sci. Congr.).
354. Annandale, N. 1921. The external ornamentation of the shell in the Viviparidae. *J. Proc. Asiat. Soc. Beng.*, **17** 147.
355. Annandale, N. 1921. Zoological results of a tour in the Far East. The viviparous water-snails of Lake Biwa, Japan. *Mem. Asiat. Soc. Beng.*, **6** 397-401.
356. Annandale, N. 1921. The apple-snails of the Malay Peninsula. *J. fed. Malay St. Mus.*, **10** 193-196.
357. Annandale, N. & Dover, C. 1921. The fauna of an Island in the Chilka Lake (contd.) Cicindelid Beetles. *Rec. Indian Mus.*, **22** 335-338.
358. Annandale, N. & Sewell, R.B.S. 1921. Oceanographic research in the British Empire. *Nature*, **107** 139.
359. Annandale, N. & Hora, S.L. 1921. The fauna of the Loktak Lake in Manipur. *J. Proc. Asiat. Soc. Beng.*, (n.s.), **17** 147 (Proc. 8<sup>th</sup> Indian Sci. Congr.).
360. Annandale, N. 1921. The genus *Temnotaia* (Viviparidae). *Rec. Indian Mus.*, **22** 293-296.

Revision of the genus *Temnotaia* Annandale (Viviparidae, Mollusca) with a key to the species.

*Temnotaia incisa*

*Temnotaia fulva*

*Temnotaia concolor*

*Temnotaia bhamoensis*

361. Annandale, N. 1921. The fauna of an Island in the Chilka Lake. Introduction. *Rec. Indian Mus.*, **22** 313-322.

The paper dealt with the Introduction to the study of the Fauna of an Island in the Chilka lake with brief notes on Mammalian Fauna, Avifauna, Fauna of Reptiles and Batrachia, Fish Fauna, Molluscan Fauna, Insect Fauna, Arachnid Fauna, Fauna of Myriapoda, Annelid Fauna, Polyzoa and Sponges.

362. Annandale, N. 1921. The birds of Barkuda Islands. *Rec. Indian Mus.*, **22** 323-330.

An annotated list of birds incorporated where Annandale included the names only of those birds seen alighted on the island.

*Corvus macrorhynchus* Wagler

*Corvus splendens* Vieill

*Acridotheres tristis* (Linn.)

*Copsychus saularis* (Linn.)

*Arachnethra asiatica* (Latham.)

*Ceryle varia* Strickland

*Merops viridis* (Linn.)

*Lophoceros birostris* (Scopoli)

*Eudynamis honorata* (Linn.)

*Athene brama* (Temm.)

*Pandion haliaetus* (Linn.)

*Haliaetus leucogaster* (Gmelin)

*Haliastur Indus* (Bodd.)

*Astur badius* (Gmel.)

*Crocopus phoenicopterus* (Lath.)

*Columba intermedia* Strickl

*Turtur orientalis* (Lath.)

*Turtur risorius* (Linn.)

*Esacus recurvirostris* (Cuvier)

*Sarcogrammus indicus* (Bodd.)

*Charadrius fulvus* (Gmelin)

*Aegialitis alexandrina* (Linn.)

*Numenius arquata* (Linn.)

*Limosa belgica* (Linn.)

*Totanus glareola* (Gmelin)

*Totanus calidris* (Linn.)  
*Totanus glottis* (Linn.)  
*Tringa subarquata* (Guldenstorp)  
*Himantopus candidus* (Bonn.)  
*Larus ichthyæetus* Pallas  
*Larus ridibundus* Linn.  
*Sterna melanogaster* (Temm.)  
*Sterna minuta* Linn.  
*Phalacrocorax carbo* (Linn.)  
*Phalacrocorax javanicus* (Horsf.)  
*Phalacrocorax fuscicollis* (Steph.)  
*Plotus melanogaster* (Pennant)  
*Ibis melanocephala* (Lath.)  
*Dissura episcopus* (Bodd.)  
*Xenorhynchus asiaticus* (Lath.)  
*Ardea cinerea*, Linn.  
*Herodias alba*, (Linn.)  
*Herodias intermedia* (Wagler)  
*Herodias garzetta* (Linn.)  
*Ardeola grayi* (Sykes)  
*Nycticorax griseus* (Linn.)  
*Anser indicus* (Lath.)  
*Dendrocycna javanica* (Hors.)  
*Dendrocycna fulva* (Gmelin)  
*Casarca rutila* (Pallas)  
*Anas poecilorhyncha* Forst  
*Dendrocitta rufa* (Scop.)  
*Dicrurus ater* (Hermann)  
*Orthotomus sutorius* (Forst.)  
*Alcedo ispida* Linn.  
*Halcyon smymensis* (Linn.)  
*Strix flammea* Linn.

363. Annandale, N. 1921. The Reptiles and Batrachia of Barkuda Islands. *Rec. Indian Mus.*, **22** 331-334.

The reptiles are proportionately well represented on Barkuda by 6 lizards, 10 snakes and two crocodiles, i.e. eighteen species in all.

Only two species of Batrachia, both common and widely distributed, have been observed.

#### REPTILES

*Gavialis gangeticus* (Gmel.)  
*Crocodilus palustris* (Lesson)  
*Hemidactylus brookii* Gray  
*Hemidactylus frenatus* D & B.  
*Calotes versicolor major* Blyth  
*Vnranus bengalensis* (Daud.)  
*Lygosoma albopunctatum* (Gray)  
*Barkudia insularis* Annandale  
*Typhlops braminus* (Daud.)  
*Typhlops diardi* Schleg.  
*Typhlops porrecius* Stol.  
*Zamenis mucosus* (Linn.)  
*Dendrelaphis tristis* (Daud.)  
*Dipsadomorphus trigonatus* (Schneid.)  
*Cerberus rhynchops* (Schneid.)  
*Bungarus coeruleus* (Schneid.)  
*Naja tripudians* (Merr.)  
*Vipera russelli* (Shaw)

#### BATRACHIA

*Rana cyanophlyctis* Schneid.  
*Bufo melanostictus* Schneid.

364. Annandale, N. 1921. The aquatic fauna of Seistan, a summary. *Rec. Indian Mus.*, 18(5) 235-253.

The aquatic fauna of Seistan is a scanty one, fairly rich in individuals, as is usual in a fauna living in abnormal conditions, but poor in species. The most salient fact about it is that it is essentially a mountain fauna acclimatized to live in a swampy depression. Geographical and biological relations, the different species found in the different bodies of water that exist in the country, viz. desert springs, stagnant pools, rivers and other water courses, and the Hamun-i-Helmand or basin into which the Helmand finally drains. Total list of species with their habitat, geographical range and remarks are given. Paper dealt with the following fauna.

## BATRACHIA

*Rana cyanophlyctic seistanica* Nikolsky

*Rana esculenta ridibunda* (Pallas)

*Bufo viridis* Laur.

## PISCES

*Discognathus phryne* Annandale

*Discognathus adiscus* Annandale

*Scaphiodon macmahoni* Regan

*Schizothorax zarudnyi* (Nikolsky)

*Schizopygopsis stoliczkae* Steind.

*Schizocypris brucei* Regan

*Nemachilus stoliczkae* (Steind.)

*Adiposia macmahoni* (Chaudh.)

*Adiposia rhadinaea* (Regan)

## MOLLUSCA : GASTROPODA

*Amnicola sistanica* Annandale & Prasad

*Vivipara helmandica* Annandale

*Limnaea bactriana* Hutton

*Limnaea gedrosiana* Annandale & Prasad

*Limnaea gedrosiana* var. *rectilabrum* Annandale & Prasad

*Limnaea hordeum* Mousson.

*Gyraulus euphraticus* Mousson

*Gyraulus convexiusculus* (Hutton)

*Segmentina calathus* (Benson)

## PELECYPODA

*Lamellidens marginalis rhadinaeus* Annandale & Prasad

*Corbicula fluminalis* (Müller)

## INSECTA : EPHEMEROPTERA

*Palnigenia ? longicauda* Oliver

## ODONATA

*Ischnura elegans* Lind.

## DIPTERA

*Chironomus pictulus*

*Psychoda bengalensis* Brun.

*Culex fatigans* Wied

*Theobaldia longiareolata* Macq.

*Symplecta punctipennis* Mg.

*Symplecta elongate* Lw

*Halmopta viridescens* Brun.

#### RHYNCHOTA

*Notonecta glauca marmorea* Fabr.

*Anisops fieberi* Kirk.

*Macrocorisa geffroyi* Leach.

*Corixa hieroglyphica* IDuf.

*Corixa affinis* iDist.

*Corixa substriata* Uhlet

*Corixa seistanensis* Dist.

*Corixa randana* Dist.

*Micronecta desertana* Dist.

*Micronecta biskrensis* Horv.

#### CRUSTACEA : DECAPODA

*Potamon (Potamon) gedrosianum* iAlcock.

#### OSTRACODA

*Eucypris clavata* Baird

*Ilyocypris villosai* Jur.

*Herpetocypris reptans* Baird

#### CLADOCERA

*Daphnia magna* Straus.

*Daphnia longispina* var. *rosea* Sars.

*Simocephalus vetulus* O.F.M.

*Ceriodaphnia pulchella* Sars.

*Ceriodaphnia reticulate* Jur.

*Bosmina longiristris* O.F.M.

#### COPEPODA

*Cyclops strenuous* Fischer-Sars.

*Cyclops leuckarti* Claus.

*Cyclops viridis* Jur.

#### CONCHOSTRACA

*Leptestheria tenuis* Sars.

#### ANNELIDA : OLIGOCHAETA

*Chaetogaster bengalensis* Annandale

*Chaetogaster punjabensis* Stephenson  
*Nais communis punjabensis* Stephenson

HIRUDINEA

*Limnatis nilotica* (Sar.)

POLYZOA

*Fredericella sultana jordanica* Annandale  
*Plumatella (Afrindella) persica* Annandale  
*Plumatella (Hyalinella) bigemmis* Annandale  
*Lophopodella carteri* (Hyatt.)

TREMATODA

*Fasciola gigantea* Cobbold

HYDROZOA

*Hydra vulgaris* Pallas

PORIFERA

*Spongilla alba* var. *rhadinæa* Annandale  
*Spongilla (Eunapius) carteri* Carter  
*Ephydatia fluviatilis* Auct.

365. Annandale, N. & Prasad, B. 1921. Materials for a generic revision of the freshwater Gastropod Molluscs of the Indian Empire. No. 3. The freshwater genera of Hydrobiidae. *Rec. Indian Mus.*, 22 1-6.

Family Hydrobiidae is divided into four subfamilies, viz. Hydrobiinae (or Paludestrinae), Bithyniinae, Mysorellinae and Lithoglyphinae. All the genera are described with key.

Subfamily HYDROBIINAE

Genus *Tricula* Benson (1843)

Subfamily BITHYNIINAE

Genus *Bithynia* Leach (1818)

Genus *Hydrobioides* Nevill (1884)

Genus *Paranerita* Annandale (1920)

Genus *Digoniostoma* Annandale (1920)

Genus *Amnicola* Gould and Haldeman (1841)

Subgenus *Alocinma* Annandale and Prashad (1919)

Genus *Sataria* Annandale (1920)

Subfamily LITHOGLYPHINAE

Genus *Lithoglyphus* Muhlfeldt (1821)

Subfamily MYSORELLINAE

Genus *Mysorella* Godwin-Austen (1919)

366. Annandale, N. & Prasad, B. 1921. Materials for a generic revision of the freshwater Gastropod Molluscs of the Indian Empire. No. 4. The Indian Ampullariidae. *Rec. Indian Mus.*, **22** 7-12.

Revision of the Indian Ampullariidae the description of all the genera and a new species are described here.

Genus *Pachylabra* Swainson

Genus *Turbinicola* gen. nov.

*Turbinicola nux* (Reeve)

*Pachylabra nevilliana* sp. nov.

367. Annandale, N. & Prasad, B. 1921. The Indian Molluscs of the estuarine sub-family Stenothyridae. *Rec. Indian Mus.*, **22** 121-136.

Among the estuarine Gastropods of the coasts of India, Malaysia and China few are commoner and more characteristic, but smaller and less conspicuous, than the Hydrobiidae of the subfamily Stenothyridae. All the species of subfamily Stenothyridae are described with their keys.

Subfamily STENOTHYRIDAE

Genus *Stenothyra* Benson

Subgenus *Stenothyra*

*Stenothyra echinata* Annandale and Prashad

*Stenothyra ornata*, sp. nov.

*Stenothyra hungerfordiana* Nevill

*Stenothyra mcnilifera* Benson

*Stenothyra soluta* Annandale and Prashad

*Stenothyra atomus* Nevill

*Stenothyra blanfordiana* Nevill

*Stenothyra minima* (Sowerby)

*Stenothyra woodmasoniana* Nevill

*Stenothyra nana* Nevill

*Stenothyra deltae* (Benson)

*Stenothyra foveolata* Benson

*Stenothyra puncticulata* (Gould)

**Subgenus *Astenothyra* nov.**

*Astenothyra miliacea* (Nevill)

*Astenothyra miliacea* Var. *gibbosula* Nevill

*Astenothyra miliacea* Var. *subangulata* Nevill

***Astenothyra burmanica* sp. nov.**

368. Annandale, N. & Seymour-Sewell, R.B. 1921. The Banded Pond Snail of India (*Vivipara bengalensis*). *Rec. Indian Mus.*, **22** 215-292.

The main object of this paper was to provide an introduction to the systematic study of the freshwater Gastropod molluscs of India. In no single species had the anatomy of the animal been studied in detail and very little was known about the life-history of any one form. Even for the common European species comparatively little information was available, and there was much indirect evidence that, in bionomics at any rate, considerable differences exist, between tropical molluscs and those of temperate climates allied to them taxonomically. In the circumstances a minute comparative study was impossible and they have thought it better, while citing all relevant references to literature available to them, to deal precisely with one species as an isolated unit in the fauna, rather than to generalize on resemblances and differences prematurely. The paper was written in four parts :

Part I. Anatomical

Part II. The ornamentation of the shell

Part III. Systematic

Part IV. Bionomics

369. Annandale, N. and Dover C. 1921. Cicindelid Beetles of Barkuda Island. *Rec. Indian Mus.*, **22** 335-348.

In the fauna of Barkuda the Cicindelinae play an important part, but the Collyrinae, represented by a single species, are very rare. This is not surprising, for the latter subfamily are mostly inhabitants of damp equatorial forests, while many species of *Cicindela*, the only Cicindelinae genus represented on Barkuda, love open sandy or gravelly spaces. It is in such situations that five of the eight species taken on the island occur.

Division ALOCOSTERNALIAE

Subfamily COLLYRINAE

*Neocollyris bonelli* Guer.

Division PLATYSTERNALIAE

Subfamily CICINDELINAE

*Cicindela (Tetremytarsa) tetrastacta* Wied.

*Cicindela fastidiosa* Dej.

*Cicindela undulata*, Dej.

*Cicindela distinguenda*, Dej.

*Cicindela sumatrensis*, Herbst.

*Cicindela aurovittata*, Brul.

*Cicindela haemorrhoidalis*,

*Cicindela catena* Fabr.

370. Annandale, N. & Dover, C. 1921. The butterflies of Barkuda Island. *Rec. Indian Mus.*, **22** 349-376.

Anotated list of the species of Barkuda described in this paper :

Family NYMPHIDAE

*Danais limniace* Cram.

*Danais plexippus* Linn.

*Danais chrysippus* Linn.

*Euploea core* Cram.

*Mycalesis visala* Moore

*Melanitis leda ismene* Cram.

*Eulepis athamas* Drury

*Neptis hylas astola* Moore

*Junonia lemonias* Linn.

*Junonia orithyia* Linn.

*Junonia almana* Linn.

*Vanessa cardui* Linn.

*Hypolimnas bolina* Linn.

*Hypolimnas misippus* Linn.

*Atella phalanta* Drmy

*Telchinia violae*, Fab

Family PAPILIONIDAE.

*Papilio hector* Linn.

*Papilio aristolochiae* Fab.

*Papilio demoleus* Linn.

*Papilio polytes romulus* Cram.

*Papilio polymnestor* Cram.  
*Papilio nomius* Esp.  
*Papilio doson eleius* Fruh.  
 Family PIERIDAE  
*Leptosia xiphia*, Fab.  
*Anaphaeis mesentina* Cram.  
*Huphina nerissa evagete* Cram.  
*Appias libythea* Fab.  
*Appias albina confusa* Fruh.  
*Ixias pyrene pirenassa* Wall.  
*Ixias marianne* Cram.  
*Catopsilia pyranthe* Linn.  
*Catopsilia pomona* Fab.  
*Terias libythea* Fab.  
*Terias hecabe* Linn.  
*Terias silhetana* Wall.  
*Colotis Calais amatus* Fab.  
*Hcbomoia glaucippe ? australis* Bert.  
*Pareronia Valeria hippia*, Fab.  
 Family LYCAENIDAE  
*Neopithecops zaimora* But.  
*Chilades laius* Cram.  
*Zizera lysimon karsandra*, Moore  
*Catachrysops strabo* Fab.  
*Catachrysops cnejus* Fab.  
*Azanus ubaldus* Cram.  
*Castalius rosimon* Cram  
*Lampides bochus* Cram.  
*Lampides celeno* Cram.  
*Polyommatus boeticus* Linn.  
*Curetis phaedrus* Fab.  
*Curetis bulls* Db. and Hew.  
*Aphnaeus vulcanus* Fab.  
*Iraota timoleon* Stoll.  
*Loxura atymnus* Cram.

Family HESPERIIDAE

*Badamia exclamationis* Fab.

*Hasora butleri* Aurivill.

*Telicota bambusae* Moore

*Pamara mathias* Fab.

*Parnara bada* Moore

*Pamara colaca* Moore

371. Annandale, N., Prasad, B. & Amin-Ud-Din. 1921. The aquatic and amphibious Molluscs of Manipur. *Rec. Indian Mus.*, **22** : 529-632.

The paper is based on a visit to the Manipur Valley paid in February and March, 1920. The specimens collected from Manipur long ago and now in the Indian Museum have proved very useful in the preparation of this paper. The paper dealt with the following chapters.

The Prosobranchia.

Fam. HYDROBIIDAE

Genus *Ammicola* Gould and Haldeman

Subgenus *Alocinma* Annandale and Prashad

*Ammicola (Alocinma) orcula* (Frauenfeld)

Genus *Digoniostoma* Annandale

*Digoniostoma pulchellum* (Benson)

*Digoniostoma textum* sp. nov.

Fam. VIVIPARIDAE

Genus *Vivipara* Montfort

*Vivipara bengalensis*

*Vivipara crassispiralis* sp. nov.

*Vivipara microchaetophora* sp. nov.

*Vivipara oxytropis* (Benson)

*Vivipara micron* sp. nov.

*Lecythoconcha* Annandale

*Lecythoconcha lccythis* (Benson)

Fam. AMPULLARIIDAE

Genus *Pachylabra* Swainson

*Pachylabra maura* (Reeve)

Family MELANIIDAE

Subfamily MELANINAE

Genus *Melanoides* Olivier

*Melanoides tuberculatus* (Muller)

Genus *Acrostoma* Brot.

*Acrostoma variabilis* (Benson)

***Acrostoma variabilis* Var. *laevis* nov.**

*Acrostoma variabilis* Var. *semilaevigata* Nevill

***Acrostoma variabilis* Var. *subspinata* nov.**

Subfamily PALUDOMINAE

Genus *Paludomus* Swainson

***Paludomus pustulosa* sp. nov.**

The Aquatic Pulmonata

Fam. Limnaeidae

Genus *Limnaea* Lamarck

*Limnaea acuminata* Lamarck

*Limnaea ovalis* Gray

***Limnaea ovalior* sp. nov.**

*Limnaea andersoniana* Nevill

Fam. PLANORBIDAE

***Indoplanorbis* gen. nov.**

*Indoplanorbis exustus* (Desh.)

Genus *Gyraulus* Agassiz

*Gyraulus convexiusculus* (Hutton).

*Gyraulus cantori* (Benson).

Fam. ANCYLIDAE

*Ancylus (Ferrissia) verruca* Benson.

***Ancylus (Ferrissia) viola* sp. nov.**

*Ancylus (Ferrissia) ceylanicus* Benson

*Ancylus (Ferrissia) baconi* Bourguignat

*Ancylus (Ferrissia) tenuis* Bourguignat

*Amphibious Pulmonata*

Family SUCCINEIDAE

Genus *Succinea* Drap.

***Succinea elegantior* Annandale sp. nov.**

*Succinea rutilans* Blanford

*Succinea semiserica* Gould.

*Succinea indica* Pfeiffer.

THE PELECYPODA

Family UNIONIDAE

Genus *Indonaia* Prashad

*Indonaia occata* (Lea)

*Indonaia bonneaudi* (Eydoux)

*Indonaia scobina* (Hanley)

*Indonaia theobaldi* (Preston)

Genus *Latnellidens* Simpson

*Lamellidens marginalis* (Lamarck)

*Lamellidens consobrinus* (Lea)

*Lamcllidens corrianus* (Lyca)

Genus *Trapezoideus* Simpson

*Trapezoidcus dhanushori* sp. nov.

Family CYRENIDAE

Genus *Corbicula* Megerle

*Corbicula occidens* Deshayes

*Corbicula striatella* Deshayes

*Corbicula subradiata* Prime

Genus *Sphaerium* Scopoli

*Sphaerium indicum* Deshayes

*Sphaerium austeni* sp. nov.

Genus *Pisidium* Pfeiffer

*Pisidium clarkeanum* G. and H. Nevill

*Pisidium hydaspicola* Theobald

And Geographical Distribution and Bionomics

372. Annandale, N. & Sewell, R.B.S. 1921. Oceanographic research in the British Empire. *Nature*, 107 139.

In the interesting leading article in *Nature* of March 10, 1921, and in the discussion which preceded it, one method of conducting oceanographic research appears to have been practically ignored. There is nothing that has stuck us more in our own work on the Indian seas lagoons than to the same place to investigate special problems. For an example, in the investigation of the fauna of Chilka Lake, a small offshoot of the Bay of Bengal is now being completed by the Zoological Survey of India. The scope for local oceanographers to be increased and additional grant for the same to be asked from the British Government and it should be a co-ordinate research rather than only a single stream like zoology or like that.

373. Annandale, N. & Hora, S.L. 1921. The fauna of the Loktak Lake in Manipur. *J. Proc. Asiat. Soc. Beng.*, (N.S.), 17 147 (Proc. 8<sup>th</sup> Indian Sci. Congr.).
374. Annandale, N. 1922. Materials for a generic revision of the freshwater Gastropod Molluscs of the Indian Empire. No. 5. The Indian Planorbidae. *Rec. Indian Mus.*, 24 357-363.

The Planorbidae are distinguished from their allies the Limnaeidae and Physidae by well defined conchological, anatomical and physiological characters. The genitalia of the Planorbidae show great diversity in the structure of the male organ, but otherwise conform to the same type as those of the Limnaeidae. In all the Planorbid genera, including *Bullinus* and *Camptocerus* among the Bullinae, it is some shade of red and pink, but its colour is much more intense in some species than in others. The genera dealt in this paper is *Planorbis*, *Indoplanorbis*, *Segmentina*, *gyraulus*, *Diplodiscus*, *Hippeutis*, *Intha* gen. nov. (*Intha capitis* sp. nov.).

375. Annandale, N. & Seymour Sewell, R.B. 1922. Fauna of Chilka Lake. The Hydrography and Invertebrate fauna of Rambha Bay in an abnormal year. *Mem. Indian Mus.*, V 677-710, pls. xxxii-xliii.
376. Annandale, N. 1922. Polyzoa in the Colombo waterworks. *Spolia Zeylan.*, 12 207-209.
377. Annandale, N. 1922. The land and freshwater molluscs of some Islands of the Inner Hebrides. *Scott. Nat.*, 19-27.
378. Annandale, N. 1922. Museums and taxonomic Zoology. *Museums J.*, 21 141-146.
379. Annandale, N. 1922. Introduction to the study of the fauna of an Island in the Chilka Lake with a list of the plants (of Barkuda). *Mem. Asiatic Soc. Bengal*, 7 257-287.
380. Annandale, N. 1922. Bivalve Molluscs injuring Brickwork in the Calcutta Docks. *J. Proc. Asiat. Soc. Beng.* (n.s), 18 555-557.

Dock wall was damaged by a species of mollusks, the Pholad (*Martesia fluminalis*). But other species like *Modiola striatula* was accumulated there.

381. Annandale, N. 1922. Notes on the genera *Bullinus* and *Physa* in the Mediterranean Basin (Mollusca Pulmonata). *Indian J. Med. Res.*, **10** 482-491. [Abstr. In *J. Proc. Asiat. Soc. Beng.* (N.S.), **18** 91 (1923)].
382. Annandale, N. 1922. Ethics of Zoology. *Calcutta Review*, (March) 1-16. [Also in *J. Proc. Asiat. Soc. Beng.* (n.s.), 79-91. (1923)]
383. Annandale, N. 1922i. The marine element in the fauna of the Ganges. *Bijar. Dierk. Natur. Art. Magistra*, Amsterdam, **22** : 143-154.
384. Annandale, N. 1922j. The macroscopic fauna of Lake Biwa. *Annotnes zool. Jap.*, **10** 127-153.
385. Annandale, N. & Hora, S.L. 1922. Parallel evolution in the Fish and Tadpoles of Mountain torrents. *Rec. Indian Mus.*, **24** 505-509.
386. Annandale, Nelson and Dover, Cedric, 1923. Advances in our knowledge of the fauna of the fresh and brackish waters of India with a bibliography for the years 1912-1922. *J. Asiat. Soc. Beng.* (n.s.), **28** 527-554.
387. Annandale, Nelson, 1923. The classification of the siluroid fishes belonging to the genus *Glyptosternum* and allied genera. Publication *Ann. & Mag. Nat. Hist.*, (9)**12** 573-577.
388. Annandale, N. 1923. The Fauna of an Island in the Chilka Lake. The habits of the termites of Barkuda. *Rec. Indian Mus.*, **25** 233-252.
389. Annandale, N. 1923. Fish and fishing in the Inle' Lake. *J. Bombay Nat. Hist. Soc.*, **28** 1038-1044, pls. 3.

The Inlé Herring Barbel, *Barbus compressiformis* (Boulenger)

The Golden Sprat Barbel, *Barileus auropurpureus* Annand

The Scaleless Minnowlet, *Sawbwa resplendens* Annand

The Crimson Minnowlet, *Microrasbora erythromicron* Annand

The Red-headed Minnowlet, *Microrasbora rubescens* Annand

The Browne's Loach, *Nemachielus brunneanus* Annand  
 The Burmese Red-Finned Barbel, *Barbus sarana caudimarginatus*  
*Barilius auropurpureus*  
 The Small Burmese Murrel, *Ophiocephalus harcourt butleri*  
 The Shan Carp, *Cyprinus carpio intha*  
 The Minnowlet, *Chaudhuria caudate*  
*Discognathus* (or *Garra*) *gravely*  
 The stickle-back eel, *Mastacembelus caudicellatus*  
 The stickle-back Eel, *Mastacembelus oatesii*  
 The Amphibious Eel, *Monopterus albus*  
 The Amphibious Eel, *Amphipnous cuchia*  
 The Black Cat Fish, *Clarias batrachus*  
 The Freshwater Herring, *Notopterus notopterus*  
 The Striped Murrel, *Ophiocephalus striatus*  
*Crossocheilus latia*

390. Annandale, N. 1923. Animal life of the Ganges. *J. Bombay nat. Hist. Soc.*, **29** 633-642.

391. Annandale, N. 1923. Advances in our knowledge of the fauna of the fresh and brackish waters of India, with a bibliography for the years 1912-1922. (Bibliography compiled by C. Dover). *J. Proc. Asiat. Soc. Beng.*, (N.S.), **18** 527-554.

392. Annandale, N. 1923. Zoological Results of the Percy Sladen Trust Expedition to Yunnan under the leadership of Professor J. W. Gregory. Aquatic Gastropod Molluscs.

Family RISSOIDAE

*Lithoglyphus taliensis*

*Tricula gregoriana*

*Hydrobioides (Parafossarulus) delavayanus*

Family DELAVAYIDAE

*Dealvaya rupicola*

*Parapyrgula coggini*

*Paraprososthenia gredleri*

*Fenouilia bicingulata*

Family MELANIIDAE

*Semisulcospira (?) aristarchorum*

*Semisulcospira lauta*

*Semisulcospira dulsis*

Family VIVIPARIDAE

*Vivipara quadrata*

*Vivipara margaryaeformis*

*Vivipara Margaryoides*

*Margarya melanoides*

*Margarya monody*

*Lecythoconcha lecythis*

*Lecythoconcha lecythoides*

*Lecythoconcha malleata*

Family LIMNAEIDAE

*Limnaea andersoniana*

393. Annandale, N. and Rao, H.S. 1923. The Molluscs of the Salt Range, Punjab. *Rec. Indian Mus.*, 25 387-398.
394. Annandale, N. & Hora, S.L. 1923. The systematic position of the Burmese fish *Chaudhuria*. *Ann. Mag. nat. Hist.*, (9)11 : 327-333.
395. Annandale, N., Fowler, G.J. and Malandkar, M.A. 1923. A chemical examination of samples of water and of shells from the Inle'Valley, with a biological note. *J. Indian Inst. Sci. Bangalore*, 6 185-193.
396. Annandale, N. and Rao, H. S. 1923. Further observations on the Molluscs of the Punjab Salt Range. *Rec. Indian Mus.*, 25 601-602.

This work was done on the collection made by Dr. S. L. Hora from both sides of the river Indus. Following species were recorded from this place.

*Bithynia tentaculata* (Linn.)

*Digoniostoma cerameopoma* (Benson)

*Buliminus (Subzebrinus) rufistrigatus* (Reeve)

*Limnea gedrosiana* A. & P.

*Vivipera bengalensis* f. *halophila*

*Eulota pentepotamiensis*

*Buliminus dextrosinister*

*Bensonia jackuemonti* (Von. Martens)

Detail description of *Bensonia jackuemonti* (Von. Martens) is given.

397. Annandale, N. 1924. Mollusca Gastropoda (revision). Pub. Director, Zoological Survey of India, Calcutta.
398. Annandale, N. 1924. Sponges from brackish water on Verlaten Islands near Krakatan. *Treubia*, 5 402-407.
399. Annandale, N. 1924. Fossil molluscs from the Oil-Measures of the Dawna Hills, Tenasserim. *Rec. geol. Surv. India*, 60 97-104, pls. 6-7.
400. Annandale, N. 1924. Divergent Evolution. *Proc. 11<sup>th</sup> Indian Sci Congr.*, 109.
401. Annandale, N. 1924. On the molluscan hosts of the human blood fluke in China and Japan. Asiatic Society of Bengal, Calcutta.
402. Annandale, N. 1924. The occurrence of *V. piscinalis f. alpestris* Blauner in Scotland. *J. Conch.*, 18 168.
403. Annandale, N. 1924. Termite mounds. *J. Bombay Nat. Hist. Soc.*, 30 25-35.

All termites do not build mounds. In all our Indian mound builders the three castes – the royal caste as it is called, the working caste and the military caste—are quite distinct, each physically incapable of performing any function but its own. The mound build by the Redemann's Termite (*Odontotermes redemann*), a species common in Ceylon and South India is having a sharply pointed cone with or without supplementary pinnacles of the same shape. The typical *O. obesus* builds a conical mound with many internal fungus gardens. The strangest of all, is the 'meridian' mound built in Australia by *Hamitermes meridionalis*. This termite inhabits the hot, dry, open plains of Northern Queensland. Its mound has the form of a high, narrow dyke, compressed in one direction and with a single long horizontal axis. One face is convex and the other is concave.

404. Annandale, N. 1924. On the molluscan hosts of the human blood fluke in China and Japan. Asiatic Society of Bengal, Calcutta.
405. Annandale, N. and Chopra, B. 1924. Molluscs of the Siju Cave, Garo Hills, Assam. *Rec. Indian Mus.*, 26 33-40.

Only three species of molluscs were found in the Siju Cave.

Family MELANIIDAE

*Paludomus blanfordiana* Nevill (Aquatic)

*Opeas gracile* (Hutton) (Terrestrial)

*Opeas cavernicola* sp. nov. (Terrestrial)

406. Annandale, N. 1924. Note on the radula of *Pyrazus palustris*. *Rec. Indian Mus.*, 26 549-552.

Detailed account of the radular teeth of *Pyrazus palustris* and of the changes which take place in their structure with the growth of the shell is incorporated.

407. Annandale, N. 1924. The Evolution of the Shell-Sculpture in freshwater snails of the family Viviparidae. *Proc. Roy. Soc. London (B)*, 96 60-76.

408. Annandale, N. 1924. Report on a small collection of molluscs from the Chekiang Province of China. *Proc. Malacol. Soc. London*, XVI 27-39.

409. Annandale, N. 1924. Evolution Convergent and Divergent. Presidential Address, Eleventh Indian Science Congress, pp. 1-26 (Bangalore 1924); *Proc. Eleventh Ind. Sci. Congress*, pp. 1-26 (1924).

410. Annandale, N. 1924. Animal life of the Ganges. *J. Bombay nat. Hist. Soc.*, 26 633-642.

411. Annandale, N. 1924. Cirripedes associated with Indian Corals of the Families *Astraeidae* and *Fungidae*. *Mem. Indian Mus.*, 8 61-68.

412. Annandale, N. 1924. Fauna of Chilka Lake. Mollusca gastropoda (revision). *Mem. Indian Mus.*, 5 853-873.

413. Annandale, N. 1924. Studies on *Schistosomiasis japonica* Appendix A. The molluscan hosts of the human blood fluke in China and Japan, and species liable to be confused with them. *Amer. Journ. Hygiene. Monographi series*, No. 3 269-294. pl. xxxvi.

414. Annandale, N. 1924. Zoological results of the Percy Sladen Trust Expedition to Yunnan under the leadership of Professor J. W. Gregory, F.R.S. Land Molluscs. *Journ. As. Soc. Bengal* (n.s.) **19** 385-397, pl. xvi (in part).
415. Annandale, N. 1924. Zoological results of the Percy Sladen Trust Expedition to Yunnan under the leadership of Professor J. W. Gregory, F.R.S. Aquatic Gastropod Molluscs. *Journ. As. Soc. Bengal* (n.s.), **19** 399-422, pl. xvii.
416. Annandale, N. & Hora, S.L. 1924. Fish Recent and fossil. A review of recent American works. *J. Proc. Asiat. Soc. Beng.*, **19**(4) 101-103.
417. Annandale, N. & Hora, S.L. 1924. A bibliography of fishes – A Review. *J. Bombay nat. Hist. Soc.*, **29** 1031-1032.
418. Annandale, N. and Hora, S. L. 1925. The freshwater fish from the Andaman Islands. *Rec. Indian Museum*, 1925. **27** 33-41, pl. 2.

Discussed the forms found in rapid-running water in the smaller streams. Gave certain particulars about the interesting genus named *Andamia* Blyth and five other interesting species.

*Sicyopterus garra* Hora sp. Nov.

*Ophiocara ophiocephalus* (Kuhl. & v. Hass.)

*Eleotris fusca* (Bl. & Schn.)

*Panchax panchax* (Ham. Buch.)

*Doryichthys insularis* Hora sp. nov.

*Andamia heteroptera* (Bleeker)

419. Annandale, N. and Hora, Sunder Lal, 1925. A freshwater fish from the oil-measures of the Dawna Hills. *Records. Geological Survey India*, 1925, **56** 204-209, pl. 14.
420. Annandale, N. & Rao, H.S. 1925. Further observations on the aquatic Gastropods of the Inle watershed. *Rec. Indian Mus.*, **27** 101-128.

34 species and 10 subspecies of true aquatic mollusks and 2 species of semi-aquatic habits were taken on the two visits to the Inle watershed. Of these, 7 species and 2 subspecies appear to be

extinct and were found in a fossil or subfossil condition. 23 species and 7 subspecies appear to be endemic in the watershed. Of these 7 species and 2 subspecies were only found subfossil. In this paper 6 species and 3 subspecies were described as new. Following species are described in this paper.

***Limnaea physcus* sp. Nov.**

***Limnaea laticallosa* sp. Nov.**

*Limnaea luteola* Lamarck

*Limnaea luteola* race *siamensis* Sowerby

*Indoplanorbis exustus* (Deshayes)

*Gyraulus velifer* (Annandale)

*Gyraulus labiatus* (Benson)

*Segmentina caenosus* (Benson)

***Segmentina taia* sp. Nov.**

*Intha capitis* Annandale

*Camptoceras* sp.

*Ferrissia baconi* (Bourg)

***Hydrobioides diperistoma* sp. Nov.**

*Hydrobioides nassa* (Theobald)

*Amnicola alticola* (Annandale)

*Paranerita physcus* (Annandale)

***Tricula horae* sp. Nov.**

*Acrostoma elongatum* (Annandale)

***Acrostoma elongatum* form *planicostata* nov.**

*Melanoides tuberculatus* (Muller)

*Melania terebra* Benson

*Taia naticoides* (Theobald)

*Taia naticoides* race *intermedia* Annandale

*Taia naticoides* race *lacustris* Annandale

*Taia shanensis* (Kobelt)

*Taia theobaldi* (Kobelt)

*Taia elitoralis* Annandale

*Taia intha* Annandale

***Taia crassicallosa* sp. Nov.**

*Taia obese* Annandale

*Taia cylindrica* Annandale

*Taia conica* Annandale

*Pachylabra conica* var. *compacta* (Reeve)

421. Annandale, N. & Rao, H.S. 1925. Materials for a revision of the recent Indian Limnaeidae (Mollusca Pulmonata). *Rec. Indian Mus.*, 27 137-189

The paper is to provide a means of identifying the species of *Limnaea* found in the Indian region. Described all the identifying characters specially Jaws and radulae, genitalia, shell and etc. for the family Limnaeidae. Following species are dealt with in this paper.

*Limnaea stagnalis* (Linn.)

***Limnaea stagnalis* race *kasmiriensis* Prashad, nov.**

*Limnaea stagnalis* form *minor* Kobelt.

*Limnaea persica* Issel

*Limnaea lagotis* (Schrank) Martens

*Limnaea lagotis* form *striata* Andreae

*Limnaea lagotis* form *costulata* Martens

*Limnaea lagotis* form *solidissima* Kobelt

*Limnaea lagotis* form *subdisjuncta* Nevill

*Limnaea lagotis* form *bactriana* Hutton

*Limnaea lagotis* form *defilippii* Issel

*Limnaea brevicauda* Sowerby

*Limnaea auricularia* (Linne)

*Limnaea truncatula* (Muller)

*Limnaea andersoniana* Nevill

*Limnaea hookeri* Reeve

*Limnaea bowelli* Preston

*Limnaea hordeum* Mousson

*Limnaea laticallosa* Annandale and Rao

*Limnaea iranica* Annandale and Prasad

*Limnaea gedrosiana* Annandale and Prasad

*Limnaea gedrosiana* form *rectilabrum* Annandale and Prasad

*Limnaea shanensis* Annandale

*Limnaea shanensis* form *typical* Annandale

***Limnaea shanensis* form *superstes* nov.**

***Limnaea shanensis* form *hehoensis* nov.**

*Limnaea physcus* Annandale and Rao

*Limnaea mimetic* Annandale

*Limnaea horae* sp. Nov.  
*Limnaea horae* form *latior* nov.  
*Limnaea acuminata* Lamarck  
*Limnaea acuminata* form *typical* Lamarck  
*Limnaea acuminata* form *patula* Troschel  
*Limnaea acuminata* form *chalmys* Benson  
*Limnaea acuminata* form *rufescens* Gray  
*Limnaea acuminata* form *gracilior* Martens  
*Limnaea acuminata* form *hians* Sowerby  
*Limnaea acuminata* form *malleata* nov.  
*Limnaea acuminata* form *brevissima* nov.  
*Limnaea biacuminata* sp. Nov.  
*Limnaea luteola* Lamarck  
*Limnaea luteola* form *typica* Lamarck  
*Limnaea luteola* form *ovalis* Gray  
*Limnaea luteola* form *australis* nov.  
*Limnaea luteola* form *impura* Troschel  
*Limnaea luteola* form *succinea* Deshayes  
*Limnaea luteola* form *siamensis* Sowerby  
*Limnaea ovalior* Annandale and Prashad

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Included the specimens from Nepal, Kumaon, Simla.

**BATRACHIA**

*Leptobrachium monticula*

*Rana cyanophlyctis*

*Rana vicina*

*Rana tigrina*

*Rana limnocharis*

*Rana Formos*

**LACERTILIA**

***Hemidactylus nepalensis* sp. nov.**

*Acanthosaura major*

***Acanthosaura kumaonensis* sp.nov.**

*Acanthosaura tricarinata*

*Calotes versicolor*

*Agama tuberculata*

*Mabuia macularia*

*Lygosoma sikkimense*

*Lygosoma himalayanum*

**OPHIDIA**

*Python molurus*

*Tropidonotus piscator*

*Tropidonotus platyceps*

*Tropidonotus stolatus*

*Tropidonotus chrysargus*

*Trachischium tenuiceps*

*Lycodon aulicus*

*Zamenis mucosus*

*Dipsadomorphus multifasciatus*

*Lachesis monticola*

*Lachesis gramineus*

**FISHES**

**CYPRINIDAE**

*Barbus ticto*

*Oreinus richardsonii*

*Diplychus annandalei*

*Basilus bendelisis*

**SILURIDAE**

*Saccobranthus fossilis*

*Euchiloglanis*

*Ophiocephalus punctatus*

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The paper deals with hydrological parameters and invertebrate fauna. Survey of the Chilka Lake was made in 1914-1920.

PROTOZOA

TRICHODINA

PORIFERA

*Cliona vastifica* Hancock

*Suberites sericeus* Theile

*Laxosuberites lacustris* (Annandale)

COELENTERATA

*Gyrostoma glaucum*

*Phytocoetes chilkaeus*

*Pelocoetes exul*

*Halianthus limnicola*

*Edwardsia tinctrix*

*Virgularia* sp.

*Acromitus rabanchatu*

*Dicyclocoeryne filamentala*

*Bimeria fluminalis*

CTENOPHORA

*Pleurobrachia globosa bengalensis*

POLYZOA

*Membranipora hippopus* Levinsen

ANNELIDA

HIRUDINEA

*Glossosiphonia ceylonensis*

*Piscicola* (a new species of the genus)

OLIGOCHAETA

*Enchytraeus barkudensis* Stephenson

*Pontodrilus barmudensis* Beddard  
*Monophylephorus parvus* Ditlevsen  
Polychaeta (Published by Mr. R. Southern)

CRUSTACEA

AMPHIPODA

*Orchestia platensis* Kroyer  
*Talorchestia martensii* (Weber)  
New species of *Niphargus*  
*Quadrivisio bengalensis* Stebbing  
*Grandidierella magna* (Giles)

ISOPODA

*Ligia exotica* Roux

CUMACEA

*Iphinoe sanguine*  
*Paradiastylis culicoides* Kemp

STOMATOPODA

*Squilla scorpio* Latreille

MYSIDACEA

*Rhopalophthalmus egregious* Hansen  
*Macropsis orientalis*  
*Potamomysis assimilis* Tattersall

DECAPODA

23 species : 10 belong to Reptantia, 6 crabs, 3 hermit crabs, 1 burrowing shrimp-like form belonging to the Tribe Thalassinidea.

INSECTA

Ephemeroptera, Odonata, Rhynchota, Diptera

MOLLUSCA

20 species : Gastropoda 12, Pelechyopoda 8.

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Mud-turtles kept living in shrines at the present day : The practice of keeping tortoises living in shrines as sacred animals is probably one of wide distribution in the east and is not now confined to any race or cult. Both land-tortoises and aquatic species are thus honoured in China. In India and Burma the animals are usually, if not always, mud-turtles of the family Trionychidae. Dr. Annandale visited three shrines, one of them Hindu, one Mahomedan and the third Buddhist, at which mud-turtles of the genus *Trionyx* live in a semi-domesticated state.

Some instances of the use of mud-turtles in worship and iconography in Northern India : Altars (*Vedi*) raised for vedic sacrifices are generally built on bricks. They put a mud turtle and give it food to last till the end of the sacrifice. If the turtle is alive, the sacrifice is regarded as auspicious; if it dies, inauspicious.

Chelonia play an important part in Hindu iconography mainly in two connections viz., the Tortoise incarnation of Vishnu and the myth of the Churning of the ocean. Both are frequently illustrated in the stone carvings of temples, in the wood-carvings of processional cars and in paintings of various kinds, more particularly in south India. The larger Trionichidae are very scarce in Peninsular India south of the Mahanadi and indeed, are probably absent altogether from the greater number of the rivers of the Madras Presidency. *Chitra indica* is only known from the Ganges, the Indus and the Irrawaddy River systems. The genus *Emyda* on the other hand, to which the little soft shelled pond-turtles of the plains 'belong, is common both in the valleys of the Ganges and the Indus and also all over the Peninsular area.

Tortoise of Indian iconography is not one of the land-tortoises (Testudinidae) but a mud turtle belonging to the family probably Trionychidae and that the reverence for the animal originated in Northern India. All representatives of the family share or shared in

the respect due to the form assumed in an incarnation, but it is possible that the actual species at one time revered was *Chitra indica*, which may very well have been the totem or the ancestral god of some particular clan or tribe.

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The apparatus described in these notes is that commonly used for weighing agricultural produce and dried fish in the markets of the villages situated round the Inlé Lake in the state of Yawnghwe.

502. Annandale, N. 1918. A Bismar Weighing-Beam from the Darjeeling District. *J. Asiat. Soc. Beng.* (n.s.), 14 243-244.

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The loom here described was seen in use in a Gaodar encampment on the shores of the Hamun-i-Helmand. The woolen cloth made with this loom is a coarse blanket like material, as a rule black with white and grey transverse stripes but without other pattern. It is produced in long strips not more than two and a half feet wide.

504. Annandale, N. 1920. Opening address in a discussion on the value of Bodily measurements in distinguishing Human Races. (Indian Science Congress, Nagpur). *J. Asiat. Soc. Beng.* (n.s.), 16 41-56, pls. iii-vi.

The paper was dealt with the measurements of anglo Indian, Chinese, Javanese, American man from the Ispahan district, Persia etc.

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"I was unable to take part in the discussion on a possible anthropological service at Edinburgh. Anthropological study should be made scientifically rather than old belief. If anthropology is a branch of science, or rather as I believe, a complex of the terminal twigs of several distinct branches, it must be studied seriously and scientifically, not merely tacked on as a kind of floral decoration to a classical or commercial education."

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