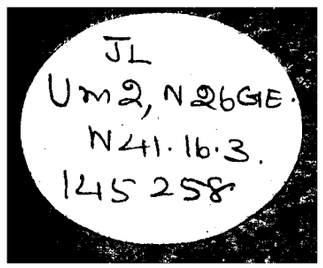

Vol. XVI July—September, 1941 No. 3

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The Indian Geographical Journal

Formerly

THE JOURNAL OF THE MADRAS GEOGRAPHICAL ASSOCIATION.

PUBLISHED QUARTERLY.

EDITOR

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THE MADRAS GEOGRAPHICAL ASSOCIATION,
Gopalapuram, Cathedral P.O., Madras.

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Vol. XVI **July—September, 1941** **No. 3**

Presidential Address of the 11th Geographical Conference

(HELD AT THE RISHI VALLEY, CHITTOOR DISTRICT)

By

M. SUBRAMANIA IYER, B.A., B.L.,
Introduction

Friends.—Sixteen years have passed since the convening and inauguration of the Geographical Association at Madras by a band of earnest workers, who realised the value of Modern Geography in Modern Life and felt the want of an organisation for it and a platform of its own. To have been one of that earliest band, to have chared and chored and done many an other thing besides, so essential to the establishment of an Indian Institution in its infancy, to have been the first Editor of its Journal and served on the newly-formed Geography Board of Studies of Madras University—on such title it is that I have accepted the invitation and presumed to appear before you; and I request your indulgent hearing while I respectfully draw your attention to some of the Aspects of Modern Geography, especially Human Geography.

Section I.—Establishment of Modern Geography in the West and Madras

1. *Rennell* (Britisher in India).—Modern Geography is said to begin with Rennell (British), who has been justly claimed as the Father of Modern Geography. Using and applying *scientific methods and principles*, he described the Hydrography of Bengal and prepared maps therefor and an *Atlas of Indostan* (abou

1790), publishing along with it a '*Notes*' which contains valuable general remarks and testifies to the minute care he brought to his investigations.

2. *Humboldt, Ritter and Suess* (German).—Rennell's work lay unnoticed for long. Humboldt, the polymath, travelled in Central and South America in the 1840's and published his results in his work, '*The Cosmos*'. There he elaborated the methods specifically known as '*Geographical Methods*' referred to later (Sec. IV, para. 6). Ritter was Professor at a German University and developed by his teaching and mapping, Geography as a science. Suess was a geologist whose monumental work, '*The Face of the Earth*' has been the foundation of all physiographical work ever since. Map-work went hand in hand.

3. *Reclus, Vidal de la Blache, and Martonne* (French).—A generation later, Reclus issued ' Universal Geography' which made Geography popular in France and England. Then came Vidal de la Blache and Martonne who between them established a School of Geography at the Sorbonne, whose works are classics in Geography.

4. *Mill, Mackinder, and Herbertson* (British).—In England, pioneer work was done by Mill and Mackinder. The appointment of Herbertson to the newly-created School of Geography at Oxford (about 1905) is the first *outstanding* recognition in Britain of the value of Modern Geography.

5. *Lyde and Fleure* (British), *Passarge* (German).—Professors Lyde, Fleure, and Passarge have carved each a niche for himself, by their fruitful generalisations and brilliance of their theories.

6. *Other workers.*—It is needless to say, Geography has come into its own in the British Isles and the excellent work organised by Professors and teachers there has radically altered the teaching, the text book and the equipment of the scholars, and the status of Modern Geography in addition.

7. *In India—Patrick Geddes.*—When Pandit Malaviyaji started Benares University, he invited opinions from savants, of whom Prof. Patrick Geddes was one. He made a strong plea for the inclusion of modern subjects like Modern Geography, which had taken strides on the Continent and made a stir in England. It fell flat there. Later, when he came to Madras (1914) to deliver lectures on Town-Planning, he made a powerful appeal for Modern Geography. It fell flat there also.

8. *In Madras, Slater.*—Later on, Dr. Slater was appointed Professor of Economics in 1917. He had in his book, '*The Making of England*' (1910) advised the study of Geography to be taken up by those who had done the Exact Sciences, as the next step in the fruition of their sciences; he had felt as Principal of Ruskin College, Oxford, the new ferment of Geography at work there. He tried to persuade the Madras Senate but in vain.

9. *In Madras, the Slater-Grieve Report.*—At last (1921) the Slater-Grieve Committee sat at it and in accordance with their Report, teaching of Geography was better provided for at the Teachers' Colleges, and college-study of Geography was recommended.

10. *The Madras Geographical Association.*—Having personally come in contact with Prof. Geddes and Prof. Slater, I was eager to do my little bit; and when Sir Ashutosh Mukherji, that greatest Educationist of his times in India, asked me, I submitted to him their views and mine on the importance and value of Modern Geography. But he was then engaged in those sharp duels with Lord Lytton, the Chancellor, which exploded finally in the famous Lytton-Mukherji Letters (1923). He could take no action. So, there too, it had to fall flat.

In 1926, Mr. N. Subrahmanyam succeeded Mr. Lakshmana Iyer, the Geography Lecturer at Saidapet. He had arrived at Modern Geography through Mr. Yates (1906), and as Geography-teacher at various centres had kept himself in touch with current thought and developments.

In 1926 we two put our heads together and planned an Association for Geography and met other two, Miss Gerrard and Mr. E. W. Green, who gave their hearty support to the proposal. Mr. H. Narayana Rao and Mr. S. Lakshmana Iyer joined us and later on Miss Birdseye.

At the first meeting convened, it was resolved to form the Madras Geographical Association; and a very stimulating Address was given by Dr. Cousins at the Inaugural Meeting.

11. *Its Work.*—It is sixteen years since then; and at this coming of age (by the Indian non-statutory reckoning) one may pass in review the work done so far.

12. *The Journal.*—From the start, the Journal has been published as a Quarterly and has been able to maintain its high level and promote research. Worthy of special mention are the series

of studies in Place Names and the District Geographies of South India and special monographs such as that on Iron and Steel in India. The Journal has received recognition in the World of Geography. It is taken by several Universities of America and Russia, is indexed in 'Geography' and 'Petermann,' and receives exchanges with high Geographical Journals. It is most gratifying to note that it has met with the approbation of great geographers of Britain, such as Profs. Fleure, Fawcett, Ogilvie and Stamp. At the instance of geographers in North India, the Journal assumes an All-India character and appears as 'The Indian Geographical Journal' from this year.

13. *The Meetings.*—Meetings are held periodically, at which lectures are arranged and discussions follow, on various geographical subjects, and they appear later on in the Journal. Special mention may be made of the meeting presided over by the Marquis of Linlithgow who has since become the Viceroy.

14. *The Provincial Geographical Conference.*—Under the auspices of the Association, an annual conference of those interested in Geography in South India is held in each District, in turn, where papers are read and discussed, bearing on the district in a sort of 'mass attack'. This Conference in Chittoor District is the eleventh of them; and there have been such studies of eleven Districts accordingly.

15. *The Summer School.*—To spread the light of the new knowledge a Summer School is held every year, where an intensive course of training is given in the practical work and methods of teaching of Modern Geography. *Multum in parvo* is its motto; and under the provision of a well-balanced course remarkable success has been achieved, thanks to the voluntary and continual services of Miss Birdseye and Messrs. Balakrishna Ayyar, V. D. Krishnaswamy and N. Subrahmanyam and others. It may be noted here that as a preliminary to opening Geography in the Mysore University, the Summer School was held at Bangalore, on the invitation of the Vice-Chancellor of that University.

16. *The Refresher Course.*—A shorter Refresher Course for the sake of teachers, especially in the mofussil, is given every year in the district where the Conference is held. It is highly valued by the teachers.

17. *Excursions.*—Geographical Tours and Excursions have been arranged and conducted in the several districts and also in

the environs of Madras. Almost all who joined them have been hearty in their praise.

18. *The University.*—For some years from the outset, the Association concentrated its attention on educating the educators, so as to dispel the ignorance about Modern Geography reigning in high places and overcome the prejudice against it. Before the Association began its work, Geography had been a compulsory subject at the Matriculation and an optional subject at the F.A. (the old name for Intermediate) under the name Physiography. By memorials and interviews and by persistent endeavours, the Association was at last successful. A separate Board of Studies was constituted; Geography was continued as a compulsory subject in the Matriculation and recognised as one of the options in the Intermediate and the B.A. Modernised syllabuses were drawn up. A Diploma Course was instituted and run by the University with its own staff.

19. *The College.*—Under the enthusiasm generated by the Association, half a dozen colleges offered and made provision for Intermediate Geography, and more than a dozen others applied to the University for permission. By an unfortunate action, the students in all the Colleges but one were left in the lurch. The enthusiasm abated and the momentum was lost,—nor is it likely to revive for at least a generation to come. A burnt child dreads the fire; and Geography in Arts Colleges has remained a 'calendar subject,' a possible option but taught nowhere, with the single exception of the Women's College of Queen Mary's. There, Intermediate Geography has been taught since 1927 and B.A. Geography has just commenced (1941). Another Women's College Sarah Tucker's, Tinnevelly has been having it for Inter. Lately Mysore University is just beginning. Though endeavours have been frustrated in Madras University, the Association rejoices that most other North Indian Universities have wakened up. Aligarh and Calcutta have the Honours Course; Patna and the Punjab have the B.A. Pass course; some others have it, and yet others have it under consideration.

20. *The School.*—It is a hundred years since Modern Education after western models began in our country. Ever since, Geography has been a School subject. Very good text-books on the old model were brought out by Rev. Symonds (of the Bishop Corrie's) at the very inception; by Henry Morris, later on; follow-

ed by George Duncan and J. B. Bilderbeck; and by the C. L. S. Manual, while Blanford's excellent work on India came out in the eighties of the last century. Up to 1911, Geography was compulsory for the Matriculation; then came the S. S. L. C. course which made it a non-examination subject. In the dire necessity our students labour under to concentrate upon marks, any non-examination subject naturally works on them like the proverbial last straw on the camel's back. So sank Geography into secondary place in Secondary Schools here and dwindled soon into insignificance. The Association from its very foundation addressed itself to remedying this sorry state of affairs. Thanks to the successive sympathetic Directors of Public Instruction and the Department of Education, Geography has been elevated into a compulsory subject without being a 'separate minimum' subject.

21. *Ideals and Achievement.*—We may now compare the work done by the Association with the objects it set itself at the outset. They are (a) to promote and diffuse geographical knowledge; (b) to secure for Geography its proper place in schools, Colleges and Universities; (c) to help to improve the methods of teaching Geography; (d) to work for a School of Geography being started; (e) to promote studies about South India from various standpoints.

The Madras Geographical Association can look back with legitimate pride on the work it has accomplished. Sixteen years, and every year crowded with activities and crowned with success!

It found Modern Geography nowhere in South India (or India for that matter) and has raised it here to its rightful place. It has successfully educated the educators and educated the people at large. It has been endeavouring to make the public cultivate 'a geographical mind' as Mr. Sabhesan put it and to 'geographise education' as Dr. Cousins suggested. Most gratifying of all, the work done by the Association has been hailed as unique in India and first-rate on its merits by veteran British Geographers. By its exertions it has earned for Madras the fame of being 'the cradle of Modern Geography in India.' And its example is spreading.

22. *The Future.*—Even if the Association ceases at this stage, it has fulfilled its mission. It has played an invaluable role in the shaping of geographical thought and teaching and in the reforming of Geographical Education in South India. Old prejudices die hard. Much yet remains to do. Work on similar lines has to be carried on; facilities for education in Geography through the

mother-tongue have to be brought about; cheap maps and instructive pictures have to be arranged for; production of appropriate literature has to be stimulated; the preparation of Home Geographies has to be undertaken; the care of Geography Teachers has to be taken in hand; etc.

23. *The Organisation.*—This narrative of the Madras Geographical Association makes one wonder how it was that the educational progress in so vital a subject as Modern Geography should have awaited and depended on the chance formation of the Association. Yet so it did. And the success is due to the subject having found an Organisation and the Man. By his devoted work, by his obstinate refusal to be side-tracked under personal bickerings, by his perseverent energy and persistence in season and out of season, by his indefatigable lecturing tours, besides the normal duties of his office, the Secretary, Mr. N. Subrahmanyam, has kept the objects steadily in view and has been fortunate in his colleagues who have accorded him their hearty co-operation.

24. *The Moral.*—My part has been like that of the wind in the dispersal of seed and my satisfaction is that the grain of seed has fallen on good ground and has grown up into the mustard tree shooting out 'great branches so that the fowls of the air may lodge under the shadow of it.' There are many other subjects that, like Modern Geography, are of vital importance to us, say Mechanics, and await similar labours for similar ends and similar success. And the story of the Geographical Association is told now in hopes that some such workers may be among you and find comfort and good cheer from that story. Obviously, it is not from any personal vain-glory that it is told here.

SECTION II

Development and Diffusion of Modern Geography in the West and Madras

1. *The Public of the West.*—The Public of the West take keen interest in their own and others' affairs. Six million copies of newspapers, for instance, are read at the breakfast tables of Britain which has a population only as big as South India, whereas the dailies here have not a lakh and a half circulation altogether. Geographical articles find their way into general as

well as special magazines. To read and understand them requires at least a working knowledge of Geography.

Besides, they are a much travelled people. Their travels and voyages have opened the world and are the bases of geographical knowledge (Witness from Hakluyt's Voyages down to the Polar Expeditions). Scientific curiosity has fitted out expeditions like the *Beagle* or the *Challenger.*

What great things of world-value have flowed from such travels! Sometime after his College, Curzon undertook a tour in Persia and Central Asia and his Sketches are as good as *Eothen.* In the Great War, while the Cabinet thought that Turks and Arabs were inseparable being together as Moslems and as Khilafaties, Curzon's travel-knowledge made him seek and find in Oxford, Lawrence, that Robert Clive of our times, and send him into Arabia and give the *coup de grace* at last to Turkey and to the Great War itself. I have already stated how Humboldt's travels laid the foundations of Modern Geography.

2. *Societies and Journals and Museums.*—The knowledge gathered is integrated at the Societies and published in their Journals. The Royal Geographical Society of England is the model to the World. At its proceedings, the attendance may be about twenty or less, but what illumination is thrown on the subject, say, Bolivia, by a consul, a prospector, a merchant, a holiday-maker and a scientist, who have all travelled thither! The Royal Scottish Geographical Society (founded by four persons) is widely supported; and as illustrative of its *wide range* of interest, you may note the article on the Punjab by Mr. Maclagan Gorrie. The 'Geography' of the English Geographical Association, Manchester, serves teachers more. The American Geographical Society and its Geographical Review (founded by W. M. Davis) are of the front rank; and others are produced *ad galore.* The Societies of France and Germany and their Journals are loaded with weighty learning. The Museums are of utmost help to Geography. Besides those of Britain there are such outstanding ones as the Natural History Museum in America, the Berlin Museum, the Science Museum at Munich, the Belgian Palace of Art.

3. *Universities, Schools and Colleges.*—Great is the debt of Modern Geography to the University. Under the functions of advancing knowledge and of consolidating and conserving it, there

is not a University abroad but has made due provision for Modern Geography, some more famous than others by the eminence of their Professors. Geography being a science and a dependent science, it is grateful to other sciences at the University. Provision is made for *systematic* study of Geography, at the College; and for *general* knowledge in it, at the Schools.

4. *Books, Text-Books, etc.*—The *School-books* provide for learning by several stages and the improvement in them day by day is striking. All the mechanical aids to the understanding are there, by way of maps, pictures, and illustrations, and get-up, as well as language and treatment. For example, here is a book taken at random, Carter and Brentnall's *Man The World Over,* Vol. 3, Blackwell, Oxford 1941 (and in War times too). In its 252 pages of text there are 277 illustrations. The *Text-books* are an ordered summary of results; and *Treatises* embody Higher Work along with the writer's own original work, e.g., Shott's *Der Indische Ozean.* As for other Sciences, so for Geography Germany has—The Primer, the Handbook, Journals and Year Book and Index. *Geographie Universelle* in serial volumes and Koeppen's *Climate* also in series are great Geographical Works.

5. *The School Geography Room.*—In well-appointed schools, the Geography Room is equipped with a full complement of modern appliances and Museum and Library as well as *modernised* teachers.

6. *Maps and Atlases.*—Maps are the *sine qua non* of Geography. Original studies in map-drawing are made in all Great Countries—even of the world as a whole, not merely by each, of its own. The map-work of Great Britain, of Germany, of France are well-known, and Russia has recently produced a highly prized set of sheets. For efficiency of school atlases, British atlases can now be compared with the German.

7. *Libraries.*— Even Public or Circulating Libraries stock, besides novels, books of travel and other books of general geographical interest.

8. *Popular Education.*—Popular Education is carried on through all the usual channels of the Press and the Platform, the Radio and the Picture House, and through special periodicals with articles brought down to the level of the man in the street from the lofty heights of the University, and Lectures given to them

with films, slides and opaque projection. The National Geographic Magazine (America) is an amazing production of Geography by pictures and coloured pictures, too.

9. *South India.*—The glimpses into what is being done in other countries, show what work lies ahead of us, in order to modernise our studies here. Unlike the case in England, there is little voluntary work and less private initiative. Government Departments, especially the scientific ones like Geology and the several other Surveys have a wealth of geographical matter but buried in blue books and inaccessible in general. The several departments themselves move in water-tight compartments and are superior to the non-official world.

There have been certain fortunate circumstances in South India. The Director of Public Instruction and the Education Department have complete control at levels below college levels and all but complete at college levels. And they are sympathetic to Modern Geography. But the difficulties come from within. Even so, under adverse conditions there has been a notable rise in the level of school-teaching, thanks to the Madras Geographical Association and its Secretary. Several schools are getting properly equipped. School books are improving. The examination is rationalised and neither cram nor crib is *necessary*. Education in the mother-tongue is being tried. And we have an excellent Museum and good Libraries.

But there is here no impulse to travel as among the Sindhis, Bengalees, or Chittagong Moslems; no popular demand for knowledge of places, such as is there met by very cheap maps sold in Lahore (As. 3 each) or in Bombay (As. 6 each, varnished). The public interest is one of apathy and indifference. That of the educated is inertia of the past, ignorance of the present and prejudice of all time.

For another thing, these peeps into the work done abroad, should be impressive of the value attached to Modern Geography, by those progressive countries. They of the West say time is money and ask men to mind their business; that they should esteem it so and take such pains over it must make one pause and think. The culture of many of us has not yet risen to the level of refraining from railing at things we do not understand in Literature, Science or Art. It is not therefore surprising to find sometimes men of high culture turn up their noses at Geography

having done that, they need know no more. Old prejudices die hard and new prejudices are caught fast.

SECTION III.

The Nature and Scope of Geography

1. *General.*—Geography has been sometimes called the 'Science of Man and his Environment.' It is spread in space but limited in Time, being in essence the knowledge of Here and Now. It embraces both the 'Sciences' and the 'Humanities,' partaking of the nature of each and using the methods of all, using over and above these the specially developed *methods of its own.* By virtue of its subject-matter, it opens 'windows into the world wonderful.' For these reasons it sustains its claim to provide true mental discipline and excellent culture.

2. *What is Geography?*—What is Geography, and what is Modern Geography, that it should be accorded a very high place in any scheme of liberal Education? This question is often on the lips of those even who have passed through School and College but have unfortunately 'by-passed' Geography.

3. *The Theme of Geography.*—Geography is primarily concerned with the surface phenomena of the Earth in relation to Man. Subjects, too, that are studied by methods specially developed by Geography fall within its purview, e.g., Botanical Geography and other adjectived Geographies.

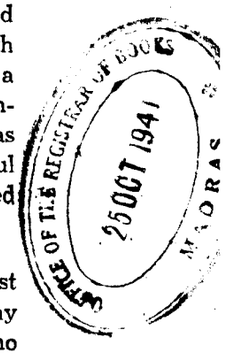
4. *Place and Direction.*—Starting with the senses of Place and Direction, we find them manifest even in lowly life; witness the hiving bee or the homing pigeon; the tigress making her home with her cubs in the heart of a tropical jungle has a perfect knowledge of her terrain and environment such as may be envied by a great military commander. In Man, the knowledge rests not upon instinct but reason; the environment is ever-spreading deep and wide, so as to reach to the uttermost corners of the globe. Such knowledge has been accumulating all along and ever improving, being handed down from generation to generation. Each age has to systematise and classify the knowledge it has received and preserve it in assimilable form, enriching it with its own additions and corrections.

5. (1) *Locality and Neighbourhood.*—Keen knowledge of Locality and Neighbourhood is exhibited by primitive communities, too, whatever be the extents of the one and the other. And from ancient times. Geography has always formed an integral part of Education in every course of instruction. We see it in the *Cyropaedia* or the *Buddhacharita.* In the *Ramayana*, for instance, Prince Rama is wrested by Viswamitra from the hands of his unwilling father, lest he should grow into a petted and spoilt child, a booby of the palace. In the Sage's education of the future monarch, Geography is taught at first hand, the Prince being conducted along mountains and rivers, through forests and hermitages, and in among the several inhabitants, and told the legendary lore also appertaining to the places and men.

5. (2) *Truth in Legend.*—Legends, by the way, enshrine often a geographical truth, embellished with mythical explanation. The fact is a fact, for all that. The legend serves to attract people's attention and preserve the wonder of it for all time. That huge rock-column jutting from the hill-top, Yadachi Malai of this (Chittoor) District, is a striking example of sub-aerial erosion. The scientific explanation is a recent thing, the science itself being recent. But, for long, people have been drawn to this piece of geographical wonder, under a legend which fancifully makes it the metamorphosis of a shepherdess with a basket of dairy product on her head who, out of feminine curiosity, looked back when forbidden to do so. Reduce it to a cold fact in a dry text-book and look at it so, and you miss the charm and wonder of nature.

5. (3) *Importance of Locality and Neighbourhood.*—Locality and Neighbourhood are the first themes of Geography, they are of the first importance to every man. Very instructive in this connexion is the rebuke administered by Aurangazeb to the old Mulle Saeb, the tutor of his boyhood, who, on hearing of his accession to the throne sought the Royal Presence in hopes of rich rewards. He was born in the purple, the Emperor said, and by the family law of Timur House had either to wade his way to the throne, sword in hand, or perish. It was necessary, he said, that he should have been taught *of the lands and peoples, of the wealth and might and resources of his own realm and of all the neighbour-kingdoms, and of the great kingdoms of the earth.* In the tender years of boyhood, the mind is most receptive and takes on impressions best. Those precious years were in his case, he complained, simply run to waste over the bare mastery of Arabic. Why was he denied, he asked, such vital knowledge. and given instead only hard grind in Arabic grammar; could not the bread of knowledge be brought home through the mother-tongue? Dismissed with such words, the old teacher repaired home a sadder if not a wiser man.

As you may remember, it is upon very similar points, Socrates rallies the twenty-year old Glaucon, that would-be leader of his State, who, with the presumption of youth sought that honour without a modicum of knowledge on such fundamental matters. To one and all, such knowledge is now vouchsafed by Geography. Under democracy, we are each a ruler though but to a 1|380 *millionth part* and have duties, in addition, as a *full* subject. If we also substitute English for Arabic and remember what burning issues Aurangazeb's questions are in Madras even to this day, we can see how in these matters the Great Mogul was far in advance of his times (which was almost three hundred years ago).



6. (1) *The Knowledge, Essential, Generally.*—We must know of our Neighbours, there is no choice given us. Who is my Neighbour, is the question posed by the man of law to Jesus who in reply gave the Parable of the Good Samaritan. Upon the moral duty of neighbourliness rests His answer which singles out the Samaritan as the true Neighbour, him who poured the oil, bound the wounds and gave two pence for the sake of the wounded man on the wayside when others, the high caste Levite and the priest, had passed him by on the other side. To the same order of ethical thinking in neighbourliness belong the great maxims, 'A great soul looks upon the whole world as one family' *Vasudhaiva kutumbakam (The Panchatantra)*; 'The nobler the soul, the larger the objects of compassion it hath.'—(Bacon).

Our hard work-a-day world demands, however, a realistic matter-of-fact solution, be the neighbour good or bad. Geography furnishes the answer, looking at things objectively, dispassionately.

6. (2) *Neighbour by Conquest of the British Rulers.*—On the political side, also, the several parts of the world are brought closer and closer together. Every great war of modern times has concluded in Britain's greater and greater accession of World-Power and the present war is destined to make Britain

the sole sovereign of the Earth. As British subjects of the British Commonwealth, we, too, have our duties to discharge as *citizens of the world.*

6. (3) *Also by Conquest of Science.*—Even otherwise, that consummation is nearer achievement than ever. Irrespective of our wills, of our likes and hates, of goodness and badness, and even in spite of ourselves, we are being fast knit together into mankind as a whole, thanks to the amazing conquests of science. The impulses given by Science are felt, in ever-increasing measure, in transport and communications, in industries and occupations, in trade and commerce, in short, in every sphere of human thought and action. The changes, so wrought, are best studied in Human Geography.

7. *Individuals may ignore Geography, but people cannot afford to.*—It is open to the individual to say of Geography as the Louvain Professor says of Greek in the *Vicar of Wakefield* (Chapter XX):—"You see, young man, I never learned Greek, and I don't find that I ever missed it. I have had a doctor's cap and gown without Greek; I have ten thousand florins a year without Greek; I eat heartily without Greek; and in short, as I don't know Greek, I do not believe there is any good in it." The last is the clinching argument of all.

Such smug frog-in-the-well outlook, which is so disdainful of Geography, may possibly work little harm to the *individual;* but no *people* can afford to say so. The people or nation that cultivate such an outlook are utterly lost.

8. *Modern World and Geographical Discoveries.*—It is indeed, the burst of Geographical Discoveries at the end of XV century that began the making of the Modern World. The Renaissance had brought on a *New Attitude to Knowledge.* To go East by going West was the invincible belief in his Geography held by the Italian Columbus who was helped also by the errors of the best map-maker of the day, the Italian Toscanelli,—errors in science often yield fruitful results. Thus doubly emboldened, he ventured on the uncharted ocean in his fragile caravels. The way opened by him was availed of by the great Navigators and the undaunted Conquistadores, who based themselves on true knowledge and real geography.. Their heritage passed on to the Europeans who have attained and established the lordship of the Earth in the centuries that followed. Enveloped in her mediaeval shell, India was

all the time in slumbers, smug in self-complacency with her frog-in-the-well outlook. That shell has been broken rudely, however, and she has to catch up as best she may with the real Geography of the Modern World as first, step to new glories.

9. *Utilitarian Values of Geography.*—Not only is Geography full of political meaning and significance but it has also great utilitarian value. In proof, one has only to name the several divisions of Geography such as Economic or Commercial Geography under which intensive studies are made of commodities of the market-place, etc.—from the single viewpoint of utility—often is it done by keen business-men. Upon competent knowledge of Geography, indeed, depend *all* Big Business and many a small business. In War, the services of the Geographer are even greater. To draw maps, to read maps, to locate positions and targets by air and sea, to know the terrain and the field of operations, to interpret photographs, all these require a thorough knowledge of Geography and it is significant to note that half the British Geography Professors are engaged in War Service doing Military Geography. Then, there are specialised studies such as The Geography of Cotton, of especial value to dealers in cotton.

10. *Its comprehensiveness.*—Geography is comprehensive—it is as wide as the Earth itself and as large as Life. Under the accumulations of knowledge of Lands and Peoples in modern times, the present day treatment embraces the whole globe with but little space left there to be peopled with the creatures of the fancy. The several peoples, their modes of life, the basic causes and conditions of their environment, along with their actions and reactions are all passed in review in Systematic Geography. It presents the entire panorama to be contemplated as a whole.

11. *Its Generality of Outlook.*—Geography is *general* in its treatment of Man and his Environment. Take, for example, the conquest of the air. The Americans, Langley and Wright Bros., were the first to send their aeroplanes into the air; the British R.A.F. are the masters of the skies; the Indian Tatas run an Air-Service from Karachi to Colombo. The Geographer looks upon these not for their being the daring exploits of particular persons or particular races though they happen to be so, but as achievements, in the air, of *Man in General.* And he proceeds to study their actuals and their potentials, working out their results to *mankind*, in general. Similarly, all the world, and not the

Moslems only, admire the beauty of Taj Mahal, as a masterpiece of human Art, *in general,* dropping the peculiarities of the actual Builder-Emperor. The type of man, from the view-point of Geography is that of Goethe's Nobleman, a favourite poem with Lord Morley, in which there are such pieces as this—'Man alone can do the impossible; he watches, judges, chooses; and by following Nature, surpasses Nature,' as he has since done in the air, for example.

12. *Its Practicality.*—Also, Geography is very practical. It treats of things as they are and have been and may be; marches on all fours with reality, constantly adjusting and readjusting itself thereto. It handles facts and figures in the concrete and there-through passing to the root-causes of phenomena explains the past and forecasts the future without relaxing its grip on the present. Being practical, it affords to that extent a valuable corrective and discipline to studies that are purely academic.

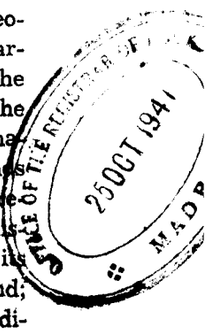
13. *Its Synthetic Character.*—Another peculiarity of Geography is its synthetic character. It draws its data from other 'sciences' and 'humanities,' and with them constructs its edifice. Its primary concern is not with the making of the brick and mortar but with making the brick and mortar into the great building, taking them from others. A whole view is presented thereby. The six blind men in the story describe the elephant by parts but a normal man sees it as a whole; the geographer sees further: the habitat, and the uses man puts it to, in Peace and War.

14. *Its admitting of academical treatment.*—At the same time, Geography lends itself to academical treatment capitally. Geography provides sumptuous food for thought and rigorous mental discipline of exact and exacting orders. In observations on the field and in the study, in the collection and selection and classification of data, in the discovery of general laws underlying phenomena, in the building-up of theories as abstruse as may be, in the exposition or extension of results, Geography provides as good a scope for study at the University as any other subject of the 'Sciences' or 'Humanities.' Doctorates are conferred in England for work done in Geography and English Universities, especially London, are the model to us in Madras.

Some there are, it is true, who are of opinion that for a subject to be academical it should be caviare to the general, be mystical and be remote from the practical side of life. Any Professor who

thinks so can make it so, easily; for such treatment—in Geography, too, there is scope.

15. *Its value as an educational subject.*—As school or college 'subject', Geography stands second to none. It feeds the growing mind of the youth with real knowledge of things about him; and *under right guidance* can exercise and strengthen it in all its faculties. It helps him the better to understand the world in which he is to take his place and play his part. Although knowledge is but one in texture and composition, the mass and complexity of knowledge at the present day compel specialisation and study in parts. To all such specialising, under names such as Physics etc., Geography makes a large portal of entry; affords a corrective to narrowness; and is complementary, by tracing and working out the consequences of their results to Man. To give examples. The geologist sees an ore and marks its distribution; the chemist analyses and assays it; the economist studies the conditions and trends of prices; the Geographer notes them all and studies also the results and effects upon life and occupation. The palaeontologist discovers the prototype of the plantain; the botanist studies its physiology; the economist finds the laws of its supply and demand; the Geographer maps its distribution on earth, notes the conditions obtaining there, the several uses to which it is and may be put, its value as food and cash crop to man, and its influence upon the peoples' lives at large.



16. *As an Examination 'subject'.*—As an examination subject, Geography can be made as good as any other subject—or quite as bad. Its very generality and comprehensiveness easily lend themselves to faking and cram, which some consider as the only royal road to success in marks and (thereby) in life. In South India, as a general rule, no subject is studied unless it is made an examination subject; and there is no examination subject but is susceptible to cram. That is rather unfortunate. The true remedy, however, lies with the examiner and the teacher. Dr. Dudley Stamp once said that in a Geography paper, he set the question, 'Discuss the Population Problem of Japan.' One candidate answered, 'I do not know if there is any such Problem in Japan, but if there be, such and such consequences would result,' exhibiting a full grasp of fundamental geography and Japanese conditions. And the Doctor added that he gave full marks for it. That is an outstanding example. Or take this from Lyde's Textbook of Geography, 'Describe the results if the Peninsula instead of spread-

ing South from the Himalayas, had spread North'. The question demands a competent grasp of the Geography. It is only such a firm grasp that is of value in catching the geological horizons at different epochs.

Section IV.

Modern Geography.

1. *The Old and the New.*—Between the Old-time Geography and the New, the difference is mainly one of outlook and method. It lies also in the inclusion of fresh data made available by the Sciences on which it depends, by the progress of geographical Discoveries, and by the results obtained through the application of the special methods of Geography.

2. *The Descriptive Gazetteer.*—The old text-book contented itself with a descriptive gazetteer of the countries treated, busy with Place and Name. That element there must remain always: we cannot place the Nile in Sind nor the Indus in Egypt. But the emphasis has been shifted from the bare fact of location to the causes and effects of location—from the Where to the How and the Why and the Wherefore.

3. *Correlations and Sequence.*—We note the sequence of things and observe the correlations—in Egypt, for example, the climate, the rainfall, the floods, the fertilised parts and the desert; the cotton, wheat and lentils; the lives and occupations of the Fellaheens, the Copts, the Arabs and the British and the International swarm. The discrete facts reveal an underlying organic unity, leaving of course, on the margin, several irreducible anomalies present in so complex a life as that of a civilised people. We arrive at last at a more satisfying and harmonious picture than before.

4. *Locational Comparison.*—The determinism of Science applies here also: 'Like causes, like effects.' To carry the example above given a step further. Let us suppose we have studied Egypt and Sind separately; certain common features force themselves on our notice—perennial rivers making Egypt the Gift of the Nile and Sind, of the Indus; the floods making soil and spreading fertility; the climate and the desert; the potentialities of cotton, in Sind. We observe the causes and effects that underlie this apparent analogy and note the differences as well.

5. *Creative Power.*—In fact, the planting of long-staple Egyptian cotton seed in Sind marks another step in the making of the country by man. The Sukkur Dam and the long-staple cotton are the direct outcome of geographical comparison between Egypt and Sind. The geographical knowledge of man has thereby attained to creative power. For another example, take rubber. Discovered at first as the latex of certain Hevea trees, native in the Equatorial forests of the Amazon, the rubber tree has been sought and found in other equatorial forests as of the Congo and the Dutch East Indies. What is more, the seed was taken from the Amazon tree to Kew Gardens, London, where, under hot-house, it was grown to a seedling. The young shoots were then transplanted in Singapore and Malaya, after first failures, successfully. The plantation rubber has since spread to wherever in the tropics there are favourable conditions of sun and rain and soil and cheap labour is made available. It is to-day of such importance as to make Great Powers compete with one another for such lands, with swords drawn.

6. 1. *Geographical Methods.*—Three distinctive methods were elaborated by Geography in the last century and are associated with location on Earth.

6. 2. *The Extension Principle—Maps.*—The principle of Extension locates the several places on Earth and draws them on Maps, where the same things or phenomena are found distributed. The study of such Distribution Maps yields valuable results apart from the visual aids the maps are to the mind, to grasp their occurrence. A classical example is the map of volcanoes showing their large distribution on either side of the Pacific. The distribution map has so soaked into the public mind that there are few official or other publications that do not display such maps.

6. 3. *Locational Comparison.*—When the same phenomena occur at several places, Locational Comparison often takes us to the true causations that may underlie them. From a close study of earthquakes wherever they occurred and of the buildings that *stood* or *fell* to the shock, the Japanese scientists (for whom Dr. Milne invented the Seismograph) have been able to design *types of substantial* buildings that can be quite *quake-proof*. So states the late William Davis in the Geographical Review of New York. Without such study the place would be abandoned as accursed and malign or only flimsy buildings would be put up. Similarly by locational comparison the Kalahari and the Atacama deserts have

been traced to the planetary movement of winds as the cause of their being deserts.

6. 4. *Locational Causality.*—The principle of Locational Causality is the same principle as in other sciences but with the locality remaining as the chief causation. Examples abound.

7. *The American Geologists : Stage, Horizon and Work.*—The American Geologists have familiarised us with the concepts of Stage, Horizon and Work. The Stage is the state of the thing studied, at a given epoch ; the Horizon is its environmental setting at that epoch; Work is the natural processes that are in operation thenceforward. These have simplified our concepts in Physical Geography.

8. *Fundamental Causations.*—Lyell's Principle—that the fundamental causes at work in the Earth in the present are those that were so in the past and will be so in the future—profoundly changed previous geological theories and are now axiomatic and widely applied in the study of Physical Geography.

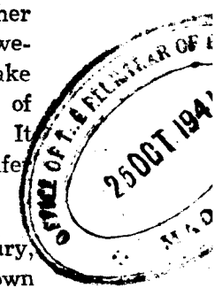
9. *Evolution.*—Darwin's epoch-making *'Origin of Species'* appeared in 1859 and changed the outlook of men. The principle of Evolution is now accepted as the normal law and extended beyond organic life to inorganic matter and imponderable mental, moral and social phenomena. The other principle of Natural Selection stands on a different pedestal.

10. *Young, Mature, and Old.*—The brilliant studies of River-Systems by William Davis, the American Geologist, led him to apply these terms—Young, Mature and Old—to describe the river at different stages of its course and life. It has since been extended to many an other object of study in the physical world such as lakes and mountains. A river with its steep gradient such as a torrent is a young river ; a river flowing between its banks, graded above the stream but not so steeply and with a gentler fall, is a mature river ; and a river is old that has begun to deposit and meander, with its fall at the gentlest. These make fruitful concepts in Physical Geography.

11. *Time Element, Continuity.*—The division, 'Young, Mature and Old,' coupled with the Evolution principle has brought Time factor to the fore, and in the study of any phenomenon this question is raised, "What was it before, What is it now, and What will it be hereafter." By this a thread of continuity is postulated and investigated.

12. *Place, Folk, and Work.*—Professor Patrick Geddes in his Lectures at Madras University has made us familiar with Le Play's ideas of 'Place, Folk and Work' as the intimately connected links which should be observed in our studies of Human Geography and especially in Town-planning. To take his own example, fisherfolk in Madras live on the shore as near the fishing grounds as may be. There the fishes come up and there it is they have to fish. You may transplant the fisherfolk to where you please but you cannot make the fishes go, too.

13. *Data-giving Sciences.*—As pointed out before, Modern Geography takes its data from others. If those change their data, Geography also must do likewise. Take this from Meteorology. Before the Great War, forecasts of Northern European weather were very wide of the mark. The Great War forced the (Norwegian) Bjerkneses (Sr. and Jr.) to have closer stations and make intensive studies. It resulted in their discovery of the Laws of Anticyclone and the weather forecasts have become reliable. It is the province, next, of Geography to note the change and infer the consequences to man flowing from reliable forecast.



14. *New Discoveries.*—It was only in the Wonderful Century, as the XIX is known, the entire continent of Africa became known and then parcelled out among the Powers of Europe ; in this century the Poles have been reached and Polar regions have been explored. Such fresh knowledge should go into current Geography.

15. *Effect on Modern Geography.*—All the methods and concepts, found and applied in these hundred years, have led to a *Rationalisation* and *Simplification* and *Integration* of Geographical matter. They have led also to the discovery and application of law and order in such matters. Upon the results thus obtained has been based the scientific presentation of Regional Geography, which is so characteristic of the modern text-book and geographical studies.

16. *Modern Geography competing for its Place.*—As just pointed out, it is only within the last 100 years, one may almost say within the last generation, that Modern Geography perfected itself. As a late-comer it has had to struggle for a place in the sun

like the contemporaneously-born nations of Japan, Italy and Germany—but with juster cause and better hopes. Already it has found its level in all civilized countries, except India. And here, too, it has begun to win its place.

Section V.

Human Geography

1. *Scope of Human Geography.*—It has been pointed out above how Geography is primarily concerned with Man in general. In Human Geography, special emphasis is laid upon Man. His action and reaction to environment are brought out better, showing conditions of his life and occupations, his settlements and communications, the influence of Populations and Distributions etc. The methods of study are just the same but certain factors stand out however. 'Man is a political animal' (Aristotle)—that is to say, he lives, moves and has his being only in communities; 'he is a tool-making animal,'—tool includes weapons; he works with Mind and Will and Freedom—and clashes are therefore inevitable, creative activity alternating with destructive activity, in cycles. He has evolved a civilisation adapted to environment, with varied ways of life and modes of living together. All these features are apparent among primitive or savage communities, too, which live closest to nature. Though they are not visible on the surface they underlie the highest civilisations, characterised though they are by the dominance of mental and moral factors. As parts of Human Geography there come in also such special studies of the particular; as Geography of Dress, of the House, of Roofs, etc.

2. *Dynamic Side.*—Change is the law of life in Geography as in the world at large. It is very essential in Human Geography, to lay stress upon its dynamic character. The common text-books leave a wrong impression of permanence in and by their presentation of facts and figures as if they were things lasting for all time —as if Geography were the mere register of facts and figures or the simple measurer of the shadows cast by them. The reader of the common text-book hardly ever gets the impression that the facts and the figures it records are subject to change by every march of Time and Mind and Nature. It presents the equilibrium as stable whereas it may only be casual or dynamic like that of a spinning top. Human Geography must also take into account the fact that the mind and spirit of man broods over matter and rings in ever-new changes.

3. *Changes due to Man's Will.*—Man can make a hell of heaven or a heaven of hell. In large-scale action, Government, which represents the organised Will of the people, counts for much. In two decades (1870-90) Japan leaped into a world-power; in one decade (1895-1905) Germany became a great seafaring nation; on two five-year plans (1925-), Russia has strided by centuries. To crown all, India, at Government's command, has, according to the Hon. Commerce Member, Sir A. Ramaswami Mudaliar, beaten record, producing in one year, half the Munition parts she requires for herself and producing also surpluses for export to others. For peace-time achievements, witness the Canal Colonies or industrialising Mysore; the Harbour of Madras or the Periyar Dam.

4. *Changes due to Progress of Science.*—Every great scientific progress has wrought corresponding changes upon Man, and the study of such effects falls within human dynamic Geography. The development of coal power has altered the face of England and led to revolutionary steamship and the railway. France, wanting coal, developed oil power and brought out the automobile. Faraday's laws being rediscovered by 1880, Hydro-electric Power has come to help countries like Italy which have had little coal or oil. Sivasamudram, Mettur, Pykara, Tata Hydro-electrics or Mandi, how they have been changing life not only in urban areas but also in the remotest villages connected by the life-giving wire!

To give a few other examples. India for ages supplied the world with indigo. German chemists succeeded in producing colours from black coal on commercial scale and the extinction of Indigo plantations followed, India herself being dependent on the cheap synthetic product and buying to the tune of several crores of rupees every year. Nitrate fertilisers are now fixed from the nitrogen of the air by the Haber Process and cheaper than Chile's. Sugar-cane bred by the Wizard Venkatraman at Coimbatore have been taken up in Bihar and U.P. and Mysore, whereby India has become self-sufficient in Sugar. Natural Rubber mentioned above as wild rubber and as 'plantation' rubber may soon have to face competition with artificial or synthetic rubber (Buna) and with substitutes found for it.

Science has increased man's power and capacity. Take the homely bicycle, first invented by a Frenchman; riding on it, a man moves faster than a horse or a Marathon prize-winner of old; a few months since, I biked at my age a hundred miles in a day

whereas I could not have done in that time twenty by walk nor have achieved a mile by runs at top-speed even with many a halt for wind, for that matter.

While Science has multiplied Man's power and capacity over matter a hundredfold, his capacity for moral good or evil has changed but little relatively. The price of that sovereign freedom, it may be, is 'blood and tears, toil and sweat.' To blame science for his retaining intact such sovereign freedom, and his heritage from arboreal ancestors or for his moral worth or want of it,—to blame science for all that seems not very just.

What power for good, for example, the aeroplane is along with the wireless, in the hands of the Canadian R.A.F. With these they blitz Berlin in War. In Peace, with these they develop the far-flung places of Canada, discover (as they have done in the last five years) nickel mines and gold mines, transporting thither all supplies, even live cows, for the support of such remote settlements, which could not have been achieved formerly in as many months as the hours the air takes.

5. (1) *Political Geography.*—Political Geography is a branch of Human Geography; and for long, Geograp[illegible]has adopted political divisions as units of study, the reg[illegible]al co[illegible]cept making headway but slowly. It is an exciting, if not also a dangerous study by its allowing the intrusion of politics and the sway and play of mob-passions.

5. (2) *Roxby's Space-Relations.*—The space-relation theory recently propounded by Prof. Roxby is a remarkable explanation of many a geographical and political activity in Human Geography. A country formed into an entity has, by its very location, certain aspects only, limited in range, for contacts with other countries. Accordingly, the activities inner and outer alike are necessarily determined and circumscribed. The Expansion of European countries only on the Atlantic Sea-board can be explained only on this basis. Switzerland and Afghanistan can be cut off from the outside world. Austria, a nodal and capital state was actually so cut off after the Great War, being surrounded by the succession states which made life in it very hard indeed, whereby the Austrians themselves had to yearn for the Anschluss. Similarly the space-relation in the case of Russia, circumscribed in contacts though vast in territory, led her to the quest for ice-free port; and that not only accounts for most European wars of the last century but has led her at last to the discovery

of Petsamo and Murmansk on the Arctic and the completion of the Russian Canal System which are the greatest and the longest in the world. So, too, Geography and not the British, said Mr. Churchill, has encircled Germany and so she must remain.

5. (3) *The Present War.*—The War now waging is itself a Geography War. 'Back to 1914, give back our lost lands' say the Germans; 'Back to 1919, give up your last-got-lands' say the British. 'Security'! cry the Germans; 'Security!' cry the British to the echo. Behind it all, there are two opposite Geographical Theories, both propounded by British Thinkers. About ten years before the Great War (1914) the Rt. Hon'ble Sir Halford Mackinder upon his study of the rise and fall of empires in the past, came to the view that there should be adjustment and readjustment of the Distribution of Lands to the Dynamism of Peoples, that the mal-adjustments have been and are the prolific parents of most wars and that if possible War should be obviated and averted. So far, both theories are agreed. The difference is in the *modus vivendi.*

The theory held by British Statesmen in general, of whom Lord Halifax, the Crusader, is a leading exponent, may be described as *the status quo theory.* Under it, the Versailles Treaty (1919) and other Great War Treaties are final, subject only to variations by consent, which should be both mutual to the Party States *and* ratified by *all* States; each state to be and to remain the equal of every other State and sovereign unto holding the keys of War and Peace in its hands, as in the status quo *but* now protected by *all.* This theory is widely held in Britain.

The other Theory given out first by Sir Halford Mackinder may be described as the Leader-Vassal Theory. Under it each small state should have affiliations with the big neighbour state and form protective groups with it. This theory is widely accepted by German Geographers and in Germany and the other Axis Powers. The term '*vassal state*' is a term invented by International jurists precisely to describe the status of Cuba in relation to U.S.A., under which Cuba is nominally and to all the world as independent and sovereign as the U.S.A., but virtually in absolute submission to it. (Since the Address was delivered, *The London Times* has in its Leaders, in July 1941, veered to the Leader-Vassal theory, eliminating, of course, Germany). Such things are best studied in Political Geography.

5. (4) *The Frontiers.*—Of the dynamic side of Human and Political Geography, there is no better illustration than the Frontiers. The Frontiers are endowed with life and movement now advancing, now retreating, keeping step with the strength and weakness of a State; the show of force it can muster; or the dread of it among the neighbours.

The Political Frontiers are in peace-time defined as the farthest extent of land to which the King's writ runs, and three miles outwards by sea. For purposes of war, it receives an extensive meaning. It covers all foreign lands brought under its sheltering wings by treaties, diplomatic actions, 'leases' such as are made by Britain to the U.S.A. That is its meaning in Lord Baldwin's famous declaration that with the coming of the air, the frontiers of England are no longer the English Channel but must be sought on the banks of the Rhine. Lord Halifax made history by extending such English Frontiers in March 1939 to the River Vistula, and in the subsequent months to the river Danube and from the Golden Horn to Cilician Gates of Turkey. It is in this sense that Britain has been declared to be the far-off bastions of U.S.A., by the U.S.A. Heads of Administration.

Natural Frontiers are some Geographical Feature beyond the Political Borders that a State overgrown in Power covets as coigns of vantage or *points d'appui*, in order to dominate its neighbours; for example, Louis XIV's dictum that the natural frontiers of France are the Rhine. And so saying he annexed the Germanic Alsace and Lorraine, countries destined to shape momentously the course of Modern European History. Those hapless countries also illustrate how unstable the equilibrium is that results from such a conception of Frontiers. Along with the Balkans, they have been verily the Apple of Discord thrown by Providence under Whose especial care Britannia is, in order to make her the Greatest Power in the World, Franco-German enmity being one of the major factors in the Expansion of England (Seeley).

The Scientific Frontiers are the lines which the military experts of the day think to be safe and easy to hold. Science is progressive and military science most rapidly and explosively so. For example, the Ancient Chinese Wall proved no stronger than the Dragons guarding the 'celestial's' coast from the 'foreign devils'; the Modern Maginot Line specially built by the French as the strongest fortification the world had known, in order to guard the Rhine, proved to be death-traps to the French at the hour of trial.

But in India the Durand Line, a practical combination of all these features and more, defines the boundaries of India, Afghanistan and Russia where they meet. It has stood the test of time for more than fifty years, a record for any Frontier.

SECTION VI

Things Indian.

1. (1) *Defences.*—The Geography of India's defences may be briefly told: *India need fear no foreign enemy.*

1. (2) *Air and Sea.*—She is a member of the British Commonwealth. By her constitution, she is a friend of the friends and enemy of the enemies of the United Kingdom, whose Allies are very many and increasing. Every now and then, the *Gazette of India Extraordinary* proclaims who are India's enemies. She is too remote by Air and Sea from possible enemy bases. Britain who has taken on herself the protection of India is already the mistress of the seas and the skies, as Sir Samuel Hoare has declared. Nature herself has provided India with the best of natural defences in the world.

1. (3) *Land.*—An invasion by land by any European Power is simply unthinkable.

1. (4) *The North-West.*—The mountain ranges of the the North-West are long and wide stretching 400 to 700 miles long and 50 to 100 miles wide and immensely high. The passes are altitudinous and hard to negotiate being often only 'porries' (cut winding-steps like those in the Madras Light House). Them, no Baby Austin car can negotiate, not to speak of modern tanks and mechanised forces. The tribes are freedom loving people and untameably turbulent (witness the Faqir of Ipi, whose movements are as regularly announced by the Associated Press as those of H.E. the Viceroy).

And on this side of the mountains, the attacker must stand up to one of the best armies in the world, the Indian Army, whose exploits in Dunkirk and Berbera, Sidi Barani and Benghazi (and since this address, at Amba Alagi and Beirut) have been applauded by the three Commanders-in-Chief since the War. We are ready to meet the enemy on his own ground. Baluchistan stretches its hands across the desert to Seistan and the British keep at Basrah, Baghdad and the Caucasus an incessant vigil over Iran and Iraq.

1. (5) *The East.*—On the Eastern side of India, which is now bounded by Burma India is all secure. The savagery of the untaught Nagas and the virgin impenetrable forests are too much for any wild invading tribes. Japan, the only possible invader, already feels encircled by the A.B.C.D. States. She fears their wrath. She has to fear the Soviet, too. For four years, Chang of C. (i.e., China) one only of the four letters, has almost alone defied both Wang, Japan's ally and Japan, too. If Japan overcome her fears and make up her wants of vital oils and steel, and venture out, there is Burma to overcome. Burma with the British and with Chang of China can defend herself easily. Burma treats India as foreign, by constitution and in every other way. Burma does not want us. If Burma does care, nevertheless, to have Indian help, India is ready to give it, because she must do so by her own constitution.

1. (6) *Aden and Singapore.*—Formerly, Aden and Singapore were thought to be the farthest outposts of India. The Australians claim Singapore as their bastion; the British Admiralty has taken over Aden.

1. (7) *Anywhere.*—In this War, it has been declared by H. E. the Commander-in-Chief, Sir Claude Auchinleck, that attack is defence and that India's defence is on the battle-fields of Europe and Africa, Asia Minor and Mesopotamia. In short, India's defences are now co-extensive with the defences of the British Commonwealth; and so, the battlefield may be anywhere in the world and India's Man-Power is as important a world factor as British Diplomacy.

2. (1) *Historical Geography.*—The Historical Geography of India seeks out—not the mere description of the back-ground however decorative, as in Macaulay's Clive—but with the deep-lying Geographical factors that interpenetrate the occurrences, viewing them apart from the purely mental and moral causations, such as are embodied in the saying 'From Jai Chand to Uma Chand, treason in the camp has been the verdict of Indian History.'

2. (2) *Former Empires.*—Purely Geographical causes are found to underlie the breakdown of Empires in India; the more the Empire grew, the weaker it became. It cracked under its own weight of Magnitude and Distance. That weakened the Central Power and the weakness of the Central Power always proved fatal to the Empire in India.

2. (3) *But Now.*—But now, modern appliances and inventions have not only reinforced the Central Government in its massive strength but have multiplied manifold its limitless power. 'India is safely ruled from London by the little finger of Colonel Amery, successor to the Great Moghul' (Mr. N. Subrahmanyam at Lahore, 1939).

3. *Geographical Law of Assimilation.*—Two different peoples, however sharp their antagonisms, and however they may have come together, cannot live side by side for long time in the same land without their undergoing internally an osmotic process as it were, and digesting and assimilating the discordant elements into one harmonious whole. And out of the clashes and impacts of mind and mind and system and system, there are often born a nobler culture and a greater civilisation.

4. (1) *Hindu-Moslem Relations.*—The Hindu-Moslem relations are no exception to the Geographical law. "It has been remarked by a writer in the Asiatic Researches (Vol. VI, p. 1) that the Hindus and Moguls[1] in India, have by their necessary intercourse, become remarkably assimilated not only in manners, disposition, etc., but even in religion; and he states a very striking fact in confirmation of his remarks, namely, that Scindiah who is a superstitious[2] Hindu, is likewise very observant of Mahometen ceremonies" (1809). Hindus repair even to-day to Tippoo Mosque at Arcot, even as Haidar Ali had done before to the faqir, for prayers for children. So they do to Mira Saheb of Nagore (Negapatam). The Hindus in South India, though the differences are largest there observe the Moharram in very large numbers. Moslems may be seen at times to resort to Sadhanas of Hindu sages.[3]

The History of India of XVIII Century shows of Wars of Religion, almost none; but only Wars of Ambition and of Succession. In the course of but two years (1748-50) four Nizams, Moslems all, were put to the edge of the sword by Moslems. So was it at

1. i.e. Moslems in the Anglo-Indian vocabulary of the time.
2. That is the epithet-synonym for 'devout' in the Hindu way, among Christian writers of the time.
3. It was Tippoo, a Sultan of Islamic zeal, that gave fresh life, with cash and honours and endowments, to the Hindu *Math* of the Sankaracharyas at Sringeri upon its having been plundered and stripped bare by the Hindu Raj of Poona—(Sringeri Records). The reverence is well-known, which was paid by his father Haidar Ali to Sri Ranganatha Temple looked over by the palace at Srirangapatam. Both lived within sound of the Temple-bells and of its music and processions.

the Nawabies of Arcot and Moorshedabad. It was indeed in the opportunity given by the Moslem Fratricidal Wars that Providence made Rulers of the British traders.

Now and then the Press reports sporadic clashes of 'Hindus and Moslems; but they have, almost all, other genesis than conflicts of religion. (Sir Henry Emerson, Governor, at Punjab Convocation). Rather are they conflicts of people, who happen to be also of different persuasions, over objects of this Earth and not for places in Heaven.

Indian History shows also many an outside race settling in India and in the course of a few generations becoming—save for such vestigial remains as names and forms and rites—as indistinguishable as water is from water. And like water, too, how separable with ease! Such susceptibility is not peculiar to Hindu or Moslem, but a general condition of Indian Life at the present day. Under hopes of political or economic rewards, dangled like carrots before the donkey, entities can be made with ease and Entity played against Entity with still greater ease. Any Entity may have its own vote and veto; and is independent and free, like a Sovereign State of the European continent.

The Geologists' concept of 'Young, Mature, and Old' may well be applied to describe the several stages and states, at a given time, of Hindu-Moslem brotherliness in India. *Examples*: The Cawnpore Belt may be considered as Young; the Guzarat as Mature; and the non-tribal Sind (712 A.D.) as Old.

Sometimes, one comes across land-slides; but that, as just pointed out, is not peculiar to them but common to all Indians. It may interrupt for the *moment* but cannot prevent for *all time* the steady operation of the Geographical Law of Assimilation of Peoples by the *genius loci* and the long results of time.

SECTION VII

The Purpose and the Philosophy of Geography

1. *Regional Geography.*—We have seen how Geography is a Synthetic Science and how comprehensive it is by its nature. Its very vastness compels studies of Geography, too, in compartments, such as Physical, Human, etc. If however, Geography is to bear full fruit, there should be a Great Synthesis of all the small syntheses of Geography so studied in parts. This is achieved through the concept of Regional Geography.

A region is a unit of the Earth which appears to have similar geographical physiognomy under the same geographical factors. It need not be the same as a political unit which is formed for ease of ruling. For example, the plateau taluks of Palmaner, Punganur, and Madanapalle of this District along with parts of Anantapur District, makes a regional unit with the contiguous Kolar, Chintamani, and Sira of Mysore State by having the same regime, of climate, topography, origins, life and occupations, etc. But they fall under three different political units.

What elements should go into the concept of region and what not, and how the operation of each such element should be demarcated in practice or application is a matter much in controversy on which no two experts *can* see eye to eye. (Vide *Scottish Geographical Journal,* 1940). Yet by each one working it out, in his own way and on his *own* view and belief, there is evolved in the course of time a greatest common measure of all.

In Regional Geography, all the geographical factors bearing on the region are brought into its study and results thereof are integrated and presented in relation to that region.

By such treatment, a complete synthesis is effected, between various parts, between the role of town and country, for example, location of places and their growth, of the soil and crops, of causes and effects set out in correlation; etc.

In such manner, by the aggregation of studies of the several component units, a satisfactory composite picture of the world in general is obtained at last. And that is the way every *modern* textbook of Geography is written.

2. *Sub-Region.*—The sub-region is to be determined where the major Region is vast and complex, as in India. But there is no agreement on what basis and how the dividing lines are to be drawn; while Indian scientists cannot settle it, Englishmen have done so for Indian Geography; and Drs. Stamp and Baker hold the field for the time, beside Dr. Pithawalla and Dr. Ahmad.

3. *Regional Geography of the World and India.*—Should the Regional Geography of the World or of India be studied, is a poser that is sometimes academically put. Study both, with emphasis on India. Geography fails of its comprehensive plan, were India alone to be studied. 'What do they know of England, who only England know?' (Kipling). For any Indian to study all the World and leave out India would be to gain all the world and lose the soul—to play *the Hamlet* without Hamlet. In Paris

there are Hotels proclaiming on the signboard "To the U.S.A. and the World" as if the U.S.A. were *outside* the world. So is it with 'India and the World.' There, however, the landlord says in effect that he prefers the dollars to the francs, the paying American customer to others. Dr. Johnson, being asked his advice upon a certain system of education, said, it was like a dispute over how to put on trousers, the left leg first in or the right; meanwhile, another put in both and got away. So it is with this question. India forms an integral part of the World and Indian Geography is studied and understood in all civilised countries.

Mr. K. Natarajan, Editor of the *Indian Social Reformer*, expresses his admiration of a system of Education in America under which a girl of 8 years old whom he met in Ann Arbor, U.S.A., was eager to know of Gandhiji, of Untouchability, etc., etc., on his being introduced to the Little Woman as a gentleman from India. 'How do you know of these things' he asked amazed. 'We discuss in class such questions once a week,' was her answer., And she was in the Primary School! (Natarajan: *My Trip to America*). Similarly, when an Indian visited a Primary School in Japan, a little Japanese girl 5 years old, who had begun her alphabets, came to him and kneeled (which is Japanese courtesy) to show respect and opening a page of her book, begged him to point out his country there. That page was a page giving the Flags of the World in colours. He pointed to the Union Jack; "No, that is England's." "Yes, it is India's." "No, No, There, you see it is written England's." He could not convince her. No more could you or I. The world comes to her ports and she could apply it and say which is which; studying Geography at first hand.

The late Justice Sir Ashutosh Chaudhuri, one of the greatest Indians, an acute thinker and a gentleman of highest culture, was astonished at being shown in the Geographical Section of the Museum at Berlin maps of Calcutta marking the scenes of every one of the Hindu-Moslem clashes that had occurred. It was patent, he said, upon the Maps, that the conflict was thickest at certain spots between Colootola Street and Harrison Road. He felt stung to shame, that he had not known of it before—he who was one of the most active and foremost citizens of Calcutta, taking always keen interest in the City and in promoting cordial relations between Hindus and Moslems. He was asked why those foci of riots being *thus* easy to locate, they in Calcutta could not anticipate them in time, nor so arrange matters there that no

riots occurred there in future—forewarned by such maps (Sept. 1922). He was overcome by such a remarkable, brilliant piece of Applied Geography of tremendous value to India. I may be permitted to add that he thereupon meditated and resolved to bring out a Reclus for India to popularise Geography and wrote to me for my co-operation. Unfortunately, he fell ill shortly after (1923) and died (1924). At the date of his visit to Berlin (1922), Germany was suffering vitally, punched and pinched for bread; yet she was as keen as ever on the bread of knowledge for knowledge's sake.

4. *Home Region.*—It is only common-sense as well as true pedagogy to pass from the known, the familiar and the concrete to the unknown, the unfamiliar and the abstract. Our first Geography must therefore be the Home Geography related to the immediate Environment; then we must go forth from Home outwards into World Geography. And lastly we must return to where we began, the Home, equipped with the knowledge of the whole and with the tools and methods of Modern Geography. Home, Abroad, and Home again—these three stages must mark our progress in Geography. It may be truly said that Geography begins and ends at Home.

Home Geography is the culmination, but can be reached only by steep ascent. The difficulties are very great but not at all insuperable. There is no text-book to read or cram. The teacher must take more than ordinary pains to come up to the mark. There can be neither inspection, nor examination in the ordinary way, because the inspector and the examiner alike know next to nothing of the local Geography of places in their range or circle with the possible exception of one or two. We take for granted familiar matters of everyday life and do not go, behind them, to the Why and the Wherefore. The mind sees no reason for it, naturally, unless aroused or compelled to do so by comparison and contrast, etc. And it is not easy, for a man who does not look beyond his nose to separate the several underlying factors; nor is the general knowledge worth much, if it fight shy of application to Local Geography.

Yet it must be made. Only a firm grasp of Local Geography can breathe life into the study of Geography and make it more than a memory of vague things in general. Only then it can become a source of vitalising knowledge and the Geographer can render reliable service. The preparation of it even for a single

area requires the coordination of several factors and the Madras Geographical Association may well promote its production.

5. *The New World Order.*—In the creative evolution that we live under, every nation seeks to make the best utilisation of its geographical opportunities. The first step is *true* knowledge of Geography to which the State and leaders either attune themselves or fail. For example, within twenty years of its Post-War existence, Czecho-Slovakia produced locomotives, cars and guns, besides such things as came of old, paper, porcelain, glass and chemicals. It was a country about a third only in size and population, of Madras Presidency; while India whose Railway System is the fourth biggest in the world cannot produce her own locomotives.

To regard the World as a whole—an achievement of the geographical outlook—is leading one, gradually and imperceptibly, *to regard mankind as one family*, an ideal presented by Geography also, as by others. There it is, by the very conditions of life under the limitations imposed upon a region by nature.

To promote the ideal, Geography may envisage the grouping and federation of regional units so as well to harmonise also with political ambitions.

The Japanese ideal is *hakko ichi aye*, a harmonious world under Heaven,—with the rider of the Asiatic being an equal of the European. The British Commonwealth is a world in itself containing all conceivable discordant elements, brought together by historical accidents more than by design; and yet it is an association which has banished war within itself, for, by, and in spite of those discordant elements. Such success is a model to the World. We are, indeed, heading for a World State, consisting of all States, but virtually ruled by the British or Anglo-Saxons as senior partners, they alone being armed for the sake of police duties, and the rest disarmed as in India. 'There the common-sense of most shall hold a fretful realm in awe'—there, 'In the Parliament of Man, the Federation of the World' (Tennyson).

This seems the most likely event to issue from this War upon the Victory of British arms. We came very near Permanent Peace at the end of the Great War. But Versailles was a Carthaginian Peace (See Lloyd George, *War Memories;* and Keynes' *Men*) and the 14-pointed Wilsonian Peace, which held out the promise of best hopes for mankind, went by the board.

6. *War and Man.*—War is in the Biology of Life and like a tree that has sown its seed before it is dead; war sows its seed before its termination and perpetuates itself. Versailles Treaty failed because it was the embodiment of Clemenceau's Security and Vengeance; and ignored and defied Geography, Economics, and History.

But War is ever brutal and never more deadly than now. To go to war is to go in the teeth of good-will among nations promoted by Geographical necessity and scientific advance; in the teeth of Peoples' Aspirations and the Time-Spirit.

Although War is in the Biology of Life, War is *not,* at this latest stage of the Modern World, a biological necessity. Nature presents the ideals of Mutual Aid (Prince Kropotkin) and Conscious Planning by Man (Huxley) and Man's harmonious adjustment so as to live together (Regional Geography) and living so as not to injure others and giving everyone his due, (Roman Jurists).

Neighbourliness, as pointed out before, is in the heart and mind of a great soul (a Mahatma). But under the impacts of Geography and Science, party walls are crumbling down. And even the ordinary folks are instructed to be so, by Geography teaching them where their strength lies and their limitations; by teaching them the philosophy of dependence on themselves and interdependence on others. This geographical lesson is an outstanding lesson.

7. *Keys of Peace and War.*—Three motives, runs a Tamil saying, begin Wars—lust after woman, land, and gold. The Ramayana and the Iliad of woes illustrate the first; the Mahabharata, the second; and modern wars, the second and the third.

This *terra firma* of ours has been adjusting itself to changes of pressure, now by gradual changes, now by violent changes such as earthquakes and volcanoes. The maladjustments to changes among mankind undergo similar adjustments. The gradual adjustment is due to causes such as Geography opening up trade and commerce and promoting good-will with better knowledge. Horrible wars and fierce battles are like the volcanic eruptions, Nature's adjustments to change.

8. *Applied Geography.*—I have given before, a striking example of Applied Geography (Sec. VII, para. 3). For another,

take pandemic diseases. By Geographical method, interpreted by statistics, Dr. Russell has made it possible to forecast and forestall cholera. By geographical methods epidemics can be located, and their course arrested; people educated and armed with such knowledge, will compel and see to the performance of duties by those concerned or responsible *not omitting* themselves. As for what an *awakened* public *conscience* may do, look at the recent action against the Croydon Council, to which an outbreak of typhoid was traced; over £200,000 damages were awarded against it for its neglect of typhoid precautions. Geographical correlation of Disease and Slum must result only in their cleaning up as the first of civic duties.

9. *The True Geographer.*—A true geographer is one who is competent by true knowledge to be of help; not necessarily one who has scored 30 or 40% marks. I have learnt to respect as true geographer the village school-master who gathers and understands geographical facts of his place, upon geographical methods, and makes them available. It is such a man that sheds the beneficent radiance of Geography and by such men, Modern Geography finds its fulfilment and vindication in this country. I met such a man, I am happy to state, on my way here and he is a clerk in a Taluq Office.

10. *Geography is Knowledge not action.*—Be it remembered that like other subjects of school and college, Geography is knowledge and not action. I say it, and say it again, lest there should be mistake. Geography finds its scope in the sphere of *knowledge;* its aim and purpose is to create *right* knowledge. Action involves exercise of the *will.* Geography helps the will with knowledge but does not operate upon the will. It is needless to say that many an other element goes into the making of an act or a fact, besides *right* knowledge.

11. *Geography takes note of man's creative activity.*—We are everyday living Geography, without our knowing it, like Moliere's character, Jourdain, who on being told he was talking Prose all his days, was lost in wonder that he had been doing so really, Prose being, in his belief, something apart. Geography may be made high and holy, too, but need not necessarily be so.

Geography sees as a whole and notes with wonder the handiwork of man. When the first tramway was laid in Madras, it carried its wires underground. The first tram ran past our College. The College peon saw it and wondered. "I have seen in my day," he said, "the first railway; it had, at any rate, an engine and blazing fire and belching smoke. But here is a thing that moves of itself. Surely, surely, the White Man is a God or a Magician. To endow life-less matter with life and movement!" In vain, the Science Master, the virile Alasingaperumal, could convince him, with illustrations and apparatus, that it was not so but an ordinary application of Science. The peon shook his head and replied, "These also are further proof of the White Man's power!" Man's work is like God's or Magician's creative, and the wonder is inherent in the work and lost only through familiarity. Geography draws attention to man's creative side, not merely to his passive reaction to environment.

12. *Dependence and Interdependence.*—Since man lives in communities only, and these again, in larger and larger groups, he cannot be really independent in any absolute sense; such independence as he often proclaims himself to possess is, in truth, dependence viewed in blinding lights from particular angles. Man is bound each to each, and each to all, in bonds of natural piety. Apposite is the Indian Parable of the Hermit and the Loincloth. There was once a Hermit who renounced the world retaining of it only a pair of modesty-cloth, just enough to cover the loins. Stealthily there came a mouse, and gnawed one of the two pieces to rags. It set the sage a-thinking: "Well, to frighten the mouse, a cat is wanted; to feed the cat, a cow is wanted; to tend the cow, a shepherd; to cheer the shepherd, a shepherdess; to keep the couple from harm, a constable; and then in like order a court, a king, a kingdom." And he went on meditating, link by link, through the entire chain till it terminated in the Universe. "I can see it now," exclaims the sage at last, "I can see it now: for the loin-cloth's sake, the Universe itself is wanted" (*kowpeena samrakshanartham idam prapancham*). The story forcibly brings home the chain of Man's Dependence.

The bountiful gifts of Nature are strewn with prodigal hand but not all things are bestowed on *one and the same* region. Not even the U.S.A. is self-contained for War (e.g., tin, rubber, etc.) and man—as is best exhibited and taught in the Lessons of Geography—takes Nature's gifts and makes use of them as best as may be, by a process of ceaseless adaptations. To cite a familiar example—Man makes his food of what his own region yields him; Rice in monsoon lands, and wheat in the temperate; date in the

hot desert and meat in the cold; fish in land and water and *erschatz* in the famines of war.

No region being self-sufficing, the wants of one region may be supplied by the surplus of another; and this is effected by war and peace; by conquests; by migrations; by trade and commerce; etc.

And that is not all. In this neo-technical age of ours, the technician multiplies manifold, nature's own gifts, and provides man with ample means of well-being. The fault for bringing about a disturbed and agitated world lies at the door of Politics and Power-race and such other controlling factors. But Nature's own plan is dependence and interdependence.

13. *The Cultural Value of Geography.*—Even those of the highest spiritual illumination have been vouchsafed a vision of the World as an integral part of their spiritual discipline; e.g., Arjuna; Buddha; Jesus; and many saints that attained beatitude. The Prophet had his fill of Geography, travelling in the caravan service of the noble Dame, Khadijah. Geography by opening 'Windows into the world wonderful' vouchsafes a Vision of the World to the matter of fact man-in-the-street; brings all the earth before his eyes; enables him to gaze also upon the wonders of man's achievement upon earth; and helps him to look at 'Life steadily and as a whole' in terms of Arnold's definition of Culture. Geography is a universal subject of universal appeal; a necessary and an informative one, for that matter; and it is for one and all.

14. *Philosophical.*—Many theories have been built upon geographical studies. One such is that Philosophy of Geography which points to the varied gifts of nature, and observes that the very variety appears to impose upon man, the principle of inter-dependence. Religion binds man to man through Heaven, through love, through God and His works. A similar function is performed by Geography but with the humblest means at his disposal. For, like Religion, it, too, binds man to man through love and even hate; through the Earth; through the things of the earth, earthy; through the works of Man and all the wonderful bounties of Nature.

Physiographic Divisions of India

By

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(Dr. Pithawalla proposed a scheme for the physiographic divissions of India, which was the subject of discussions at the sessions of the Indian Science Congress held at Lahore in 1939[a] and at Benares in 1941. The scheme has been severely criticised and Dr. Ahmad[b] showed at Benares that it was quite unacceptable. He has suggested an entirely new scheme in its place.)

Physiography has been variously defined and there has been a great difference of opinion as to the precise scope of this science but there is a strong disposition to regard physiography as another name for physical geography. By some physiography is restricted to narrower limits being regarded as the physical geography of the land.[1] As Wadia has put it "Physiography is that branch of geology which deals with the development of the existing contours of the land part of the globe."[2] In a scheme of physiographic divisions "relief and land-forms'[3] should make the main basis of classification. These are obviously the result of the work of various geological agents on the structure of the country.

According to relief India falls under four major divisions:—

(i) The Mountains of extra-peninsular India, comprising the Himalayas in the north and their offshoots in the north-west and the north-east.

(ii) The great alluvial plain of northern India, commonly called the Indo-Gangetic plain.

(iii) The Deccan Plateau.

(iv) The coastal lowlands.

(a) Published in the *Journal of the Madras Geographical Association*, 1939.

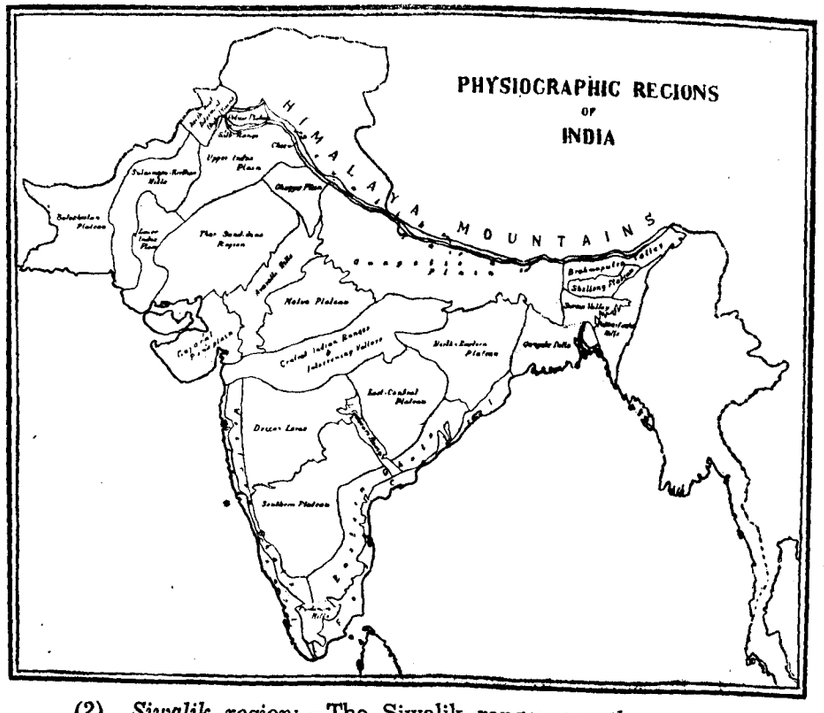
(b) For his criticism of Pithawalla's work see the proceedings of the Indian Science Congress, 1941.

1. Physiography by Salisbury, page 3.
2. Wadia, *Geologoy of India*, page 308.
3. Using the word physiography in the narrow sense.

To divide India into physiographic regions each of these major orographic divisions may be sub-divided on the basis given above.

I. *Mountains of Extra-peninsular India*

(1) *The Himalayan Mountains*:—A belt of snow-covered new folded mountains extending from the Pamirs in an unbroken wall for over 1250 miles in the north of India. In a region of 100 to 150 miles wide the Himalayas consist of a series of more or less parallel or oblique or even converging ranges intersected by numerous transverse valleys and extensive plateaus. It includes all the ranges lying to the north of the Siwaliks—the crystalline and metamorphic zone of the lesser main Himalayas as well as the marine fossiliferous lying behind it. The whole region has been subjected to successive compression and has suffered great contortion and presents a great complexity of land-forms. The Scenery is marked by a monotony of steep slopes and ridges, occasionally relieved by a bold bluff, or a rocky gorge or a wide longitudinal valley.



(2) *Siwalik region*:—The Siwalik ranges are the most recently folded superficial hills which topographically belong to the

mountain area but geographically to the plains. They consist of fresh water sediments, laid down at the foot of the Himalayas, similar in nature to those underlying the plains of Northern India. They represent a period of continental sedimentation. There has been no metamorphism of the strata beyond the hardening of the lower rocks by age. They are easily eroded and have been laid bare of soil in areas of deforestation. They are easily distinguished from the main Himalayan region by their low height—about 3,000 to 4,000 ft. Excepting a short distance of fifty miles opposite the basin of Tista and Raidak, the Siwaliks have been shown to skirt the Himalayas throughout their length from the Brahmaputra to the Indus and even beyond it. The width of the zone varies from 5 to 30 miles. In some places they are pressed against the lesser Himalayas and are not easily identified but frequently they are separated from them by longitudinal fertile valleys called the Duns, e.g. Dehra Dun, Kalka Dun and Kangra Dun, etc. The outer margin of the Siwaliks is everywhere fringed with a belt of gravel deposited by the streams draining the hills, which is known as *Bhabbar*.

(3) *Suleiman-Kirthar hills*:—A zone of new folded low hills mostly bare or devoid of soil cover, formed of hard lime-stone and sand-stone, here and there alternating with bands of shaly rocks. They are of simple structure. They do not show the complex inversion and thrust planes met with in the Himalayan region! They are an expression of the work of running water in an arid climate acting on land of different hardness. There are many narrow steep-sided gorges, and even in broad open valleys numerous runnels of water have carved out gullies. Another feature of the region is the prevalence of great gravel slopes known as Dhaman,[4] fringing the foot of the hills. The mountain hinterlands are wild and hard both in relief and climate.

(4) *North-west intermont high plains*:—North of Suleimans, the continuity of the hills is broken and they grow transverse to the Indus demarcating the plains of Bannu and Peshawar, which lie in the basins of the Kurram and Kabul rivers. They are very fertile. The two are separated from one another by the hills of Kohat.

(5) *Potwar Plateau*:—A plateau about 1,000 ft. above the Indus Plain south of the Salt Range. It is covered in the centre

4. It may be compared with the Bhabbar.

with alluvial deposits; in other parts a rock-strewn plain from which project here and there isolated hill ridges and thin narrow ridges of rocks. A frequent type of ridge in Potwar consists of a single bed of some resistent rock standing more or less vertically like a wall of stone, often carved and fretted in a fantastic manner. The surface is greatly cut by deep ravines in the soft Siwalik beds, which the whole area is composed of. Extensive deposits of gravel sand and silt exist and many large erratic blocks are found.

(6) *The Salt Range* is a lofty scarp forming a crescent ridge to the Potwar plateau, disturbed by faulting and minor folding and exposing representatives of most of the great systems from Cambrian to Tertiary. Southward over-folding and thrusting is a dominant structural feature.

The crest of the range forms a plateau which is more or less undulating and is cut into by stream valleys. It has a unique scenery of vividly bare rocks.

(7) *Patkai-Lushai hills*:—On the eastern border of India, a series of hills generally with a north-south strike lie from Patkai to Lushai hills. They were formed along with the Himalayas and consist of tertiary shales and sand-stones. Contrasting with the hills of the western border their physical landscape is associated with that of a damp climate at all seasons.

(8) *Shillong Plateau*:—The Shillong plateau is a detached fragment of the peninsula. A gneissic mass it forms a wedge occupying an acute angle between two regions of contortion. The Rengma (mikir) hills are separated from the main plateau and provide a passage for the cyclones.

II. *Indo-Gangetic Plain.*

(9) *Tarai Region*:—East of the Jumna south of the gravel slopes of the Bhabbar is a swampy region caused by the issue of water which has percolated underground through the Bhabbar. It is known as Tarai. It is a narrow belt with varying width on the average less than 5 miles.

(10) *Chos Region*:—West of Jumna, on account of a diminished rainfall the Tarai region is absent and gives place to a sandy region 15 to 25 miles in width occupied by non-perennial hill torrents known as *chos*. They pour down into the plain in the rains at almost every mile. Rising generally in the Siwaliks they form a network of sandy beds which become less and less marked with increasing distance from the hills. The chos beds in the plain are broad rivers of sand with very slight fall. The beds are often non-existent or at the best composed of unstable sand liable to be washed by any flood. Except for floods they are dry throughout the year.

(11) *The Upper Indus or Punjab Plain*:—It consists of the valley plain of the five rivers. Owing to the greater fall in their gradients the deposits of the rivers are very sandy and their character tends to diminish the pluvial denudation of the surface by allowing the water to sink into the soil. The high banks of the rivers are frequently capped by hills of wind-blown sand, known as *Bhur*. The action of winds upon the sand of the river, the formation of Bhur-land and the elevation of the ground in the neighbourhood of the river banks, are exhibited in this plain to a greater extent than in the Gangetic plain. Rivers have carved their valleys in the former deposits. In the interfluves or *doabs* land gradually rises from the river banks till it culminates in central uplands which are called "Bars". The bar tracts were previously desolate scenes of rolling sand-dunes, patched with grass and glistening with salt and formed waste lands. Large portions of them have now been converted into fertile tracts with the extension of irrigation. The subterranean Delhi-Shahpur ridge divides the plain into two sections: the eastern one has a higher water-table with attendant landscape. Incidently it has also a higher rainfall.

(12) *The lower Indus Plain*:—This region has been demarcated from the upper Indus plain at the narrow out-let of the Indus waters west of Jaisalmer. The surface of the Indus alluvium in upper sind differs but little from that of the Panjab and considerable portion of the area is flooded annually and the whole drainage of the river is there confined to a comparatively narrow tract. Some permanent marshes of large size also exist.

This section of the Indus plain contains a very important physiographic feature. The river between Sukkur and Rohri has cut its way through a low range of lime-stone hills, surrounded on all sides by alluvial deposits. A barrage has completely revolutionised the economic structure of this region. Situated in an arid climate this region is in general a gift of the Indus, and now in particular of the firm banks of Sukkur.

Below Hyderabad lies the delta which may make a good subregion. In this the channels of the river frequently change, more frequently perhaps than in the Gangetic delta,

(13) *The Ghaggar plain*:—Between the Sutlej and the Jumna lies the Ghaggar plain, drained by the Ghaggar and other minor streams most of which lose their water by evaporation or seepage within this plain. The whole work done by them is expended within the area and none of the detritus from the Siwaliks is carried beyond this area. All the southern part of this plain where the final evaporation takes place is extensively impregnated with saline matter; so good drinking water is scarce.

On account of the flatness of the country, in no part of the Indo-Gangetic plain have more important changes taken place in the courses of rivers than in this area. Encroachment of sand from Rajputana in the south and from the chos region in the north is gradually contributing to the dryness of the area.

(14) *Gangetic Plain*:—The whole expanse of this plain with unvarying monotony, has been formed by the alluvium of the Ganges and its numerous tributaries, deposited on dry land accumulating to a thickness of over 3,000 ft. The deposits are continental. The greater portion of it is composed of *Bhangar*[5] land through which the rivers have cut Khadar[6] valleys.

The Bhangar surface is, as a rule, nearly flat but is much cut by ravines in the neighbourhood of rivers. From the form of the plain it is obvious that over large parts of the area rivers have been more important as agents of denudation cutting their channels deeper and deeper in the Bhangar, the alluvium of which was formerly deposited by the streams of the same drainage and at a time when the main rivers flowed at a comparatively higher level.

A characteristic of the clayey parts of the plain, particularly in the older deposits, is the abundant disseminations of impure calcareous matter in the form of irregular concretions, known as *Kankar*.

(15) *Gangetic delta*:—It is a natural continuation and the wide development of the Khadar of the upper portion of the river. Here the river ceases to carry and collect but begins to drop and distribute. Its course is marked by scattering silts and shifting channels, with widespread floods in the rainy season. The whole region is further characterised by the abundance of large swamps or Bils, which occupy the old channels. The river has gradually

5. Old alluvium.
6. New alluvium.

shifted its bed from the western towards eastern Bengal and so the geomorphological aspect varies according to the degree and nature of its activity.

West of the main stream into which the Brahmaputra falls lies the old delta of Central and Western Bengal. In the Western Bengal, beyond Bhagirathi-Hoooghly, there has been interference with the natural action of the river by large quantities of silt brought by the rivers of the plateau on account of its reckless deforestation and the creation of artificial embankments. This has prevented the completion of the natural process of land formation. These extensive and intricate embankments carry with them the danger of floods. In Central Bengal a large area has been raised above the flood level and the process of land formation is almost complete. It is a region of dead and dying rivers and the conditions are regulated by the recession eastwards of the Ganges and its affluents. Here the problem is to secure in the old channels a continued and adequate flow of water.

In the Eastern Bengal lies the new delta, where the river is still vigorously active in land formation. It is a typical delta region, covered by a network of rivers, streams and creeks. Here the marshes or *jhils* are more extensive and the banks of the streams less consolidated. In the rainy season a great part of the area is flooded and a rich deposit of silt is extensively spread over the country. Only the river mounds which are used for habitation appear above the water.

The Surma or Sylhet valley along which the Brahmaputra formerly flowed, may be demarcated as a sub-region with all the physical aspects of the new delta region excepting the existence of distributaries.

(16) *Brahmaputra Valley*:—It is a gigantic khadar, the greater portion being liable to flooding. The river divides and reunites many times. On either side of it there is a belt of marshy land, lying at some distance from the river. There are, however, here and there higher tracts, at some places mere mounds, rising a little above the general plain, and at others small plains.[7]

III. *The Deccan Plateau.*

(17) *Thar Sand-dune region*:—Between the Indus and the Aravallis lies the great arid tract of India known as the Thar

7. Which may be called bhangar.

desert. It is covered with a great thickness of aeolian deposits, and sand-dunes form the characteristic feature of the landscape. It provides a notable example of the evolution of desert topography within comparatively recent geological times. Here the powerful insolation and wind action have been dominant as agents of denudation. There is an abundance of debris and a general absence of soil and humus with peculiar sand-blasted and treeless landscape.

In the east and north numerous rock hills of low elevation crop out from expanses of sand and silt, dotted at long intervals by salt lakes. These rocky projections belong to the old rocks of the country. In their bare, bold rounded outcrops and sand-blasted topography they present a striking illustration of the phenomena of wind erosion.

(18) *Aravalli hills*:—This region is composed of crystalline and metamorphic rocks of great antiquity, for the most part much altered and quite unfossiliferous schists and quartzites. All are folded together in complicated contortions.

The Aravallis are an excellent example of an old-folded mountain complex reduced, by long and continuous degradation, to little more than the wreck of a mountain range. The original Aravalli mountain was a folded range of pre-Vindhyan age, which was eroded and either partially or completely base-levelled in pre-Vindhyan times. It was rejuvenated as a horst along a pair of roughly parallel boundary faults either in the Purana or Dravidian periods. A large portion of the region in the northern half is now covered by pleistocene and recent deposits and here low flat stretches of land are frequent.

(19) *Malwa Plateau*:—It includes the whole area lying in the east of the Aravallis and north of the Vindhyan range and consists of rocks of varied age and structure, archaean granites and gneisses, Vindhyan sandstones and Trap lavas occupying most of the area. It is a low undulating plateau 1,000 to 2,000 ft. in height. Near the Gangetic plain the plateau dwindles into a country of broken relief, the whole dissected by deep gullies and ravines which generally carry water only for a short while. The whole region drains towards the north-east.

(20) *Central Indian ranges and Intervening Valleys*:—It includes the belt of high lands lying east and west in Central India, on either side of the Narbada-Son trough. The Vindhyas and their continuation, Kaimur hills border it on the north; and the

Satpura and its continuation Mahadev and Maikal hills on the south. Further south lies the Valley of the Tapti which is bordered by the Ajanta hills continued eastwards by the Gawilgarh Range. The highlands form escarpments towards the Valleys and are generally residual in origin. Outcrops of basalt and sandstone are predominant features of landscape.

The intervening Valleys of Narbada and Tapti, whether the result of subsidence or denudation, are long and narrow. They provide quite a big area of low relief and are in a large portion covered with fertile alluvial deposits.

(21) *Deccan lava*:—A region of flat relief. It is covered by fertile black cotton soil formed by the disintegration of basalt which lies underneath. The soil cover is quite deep. In the dry season when the soil shrinks, deep and wide cracks appear all over the area.

(22) *North-East Plateau*:—It includes Chhota Nagpur and the adjacent parts of Orissa and Central Provinces. Here there is a wide distribution of coal-bearing lower Gondwana rocks and metalliferous Dharwar rocks. In this region are found the principal coal and iron mines of India.

(23) *East-Central Plateau*:—This is partly covered by the Purana and partly by archaean rocks. The former have been much worn down to constitute the Chattisgarh plain in the upper Mahanadi basins. The Dharwar rocks are rich in manganese and iron ores.

(24) *Lower Godavari Valley*:—The linear tract of lower Godavari, an important zone of sedimentation in carboniferous times, contains outrops of important coal-beds. Limestone is also found associated with the area.

(25) *Southern Plateau*:—South of Godavari basin and Deccan lavas lies a large area of archaean rocks in which highly folded and foliated immeasureably old gneisses and schists and plutonic rocks have been exposed. Of rocks, sedimentary in origin, the Cuddapahs, in a crescent between the Penner and the Kistna, and the long outcrops of Dharwar rocks further west, are important.

The whole surface of the country presents a gently undulatting aspect, characteristic of an ancient land surface. Locally there may be found scarped residual hills cut by narrow steep-sided

valleys or sharp-crested ridges rising from the plains. Great granitic tors and bosses are found here and there to give variety to the general aspect of the country. The valleys, with a few local exceptions, are broad and open and the gradients of the rivers low. The soil cover is thin. The region gains in height towards the south.

(26) *Western Ghats or "Sahyadri"* are residual mountains running parallel to the west coast throughout its length, only interrupted by the Palghat Gap across which they are known as the Cardamom hills. They form an imposing scarp or cliff with its steep side facing the Arabian sea.

They consist, to the north, of horizontal or nearly horizontal strata of basaltic rocks, cut into a steep scarp on the western side by denudation and similarly eroded, though less abruptly, on the eastern side. Where horizontal strata of varying degrees of resistence are subjected to sub-aerial denudation precipitous square-cut peaks abound and give a fantastic appearance to the scenery of the Ghats.

South of about 16° N, with the change in the geological formation, the horizontal igneous rocks disappear, and the range is composed of ancient metamorphic strata. Here in some places there is a distinct connection between the strike of the foliation and the direction of the hills but the connection is local. It is denudation which has played the principal part in determining their contours.

(27) *Eastern Ghats* consist of a group of hills more or less isolated from each other though sufficiently in line to demarcate the table-land from the plain below. They are very complex in structure. The chain as a whole has no separate existence. It is composed of several plateau scarps and small isolated ridges of metamorphic rocks separated from each other by broad plains and having in reality but little connection with one another. Some of these scarps are surviving relics of ancient mountain chains elevated contemporaneously with the Aravallis.

From the coast there is an abrupt rise inland somewhat similar to that of the Western Ghats though on a smaller scale. They are scattered, broken and of much inferior altitudes. Occasionally they throw spurs which break the coast into headlands.

(28) *Gujarat peneplain:*—It consists of two distinct sections —Kathiawar and Gujarat proper. Kathiawar, consisting mostly of

Deccan traps and jurassic limestone is rough and hilly while in Gujarat the older formations have been planed down and buried under pleistocene and recent deposits.

IV. *Coastal Lowlands*

(29) *West Coast:*—It consists of a narrow strip between the Western Ghats and the Arabian Sea. Whether a submarine plain or one of marine denudation formed by wearing down of the edges of the tableland, it consists in its northern part of the Deccan lavas and in the south of archaean gneisses and granites, with fringe of recent deposits on the coast of Malabar.

The northern or Konkan part, lying in front of the lava-capped Ghats is relatively firm, unbroken, narrow and more or less rough. Numerous short swift streams which flow down from the Ghats have each formed their alluvial fans while the waves which beat against the shore during the period of south-west monsoon have piled up sand banks against them. The cover of alluvium is not continuous as many spurs from the hills spread themselves out to the coast.

The southern portion of Malabar is a land of lagoons fringed with sand-dunes. Great heat and high humidity are very effective in the weathering of the metamorphic rocks which constitute the Western Ghats in these latitudes and provide plenty of sand.

(30) *East Coast:*—The east coast is a submarine plain which has emerged out of the sea with the general epeirogenic uplift of the peninsula ; the whole is covered by the alluvium brought down by the rivers. The formation of deltas is a conspicuous feature of this coast.

It may be also divided into two sections. The east coast north is structurally narrower, with the delta of the Mahanadi in the north and the deltas of the Godavari and the Kistna in the south. Between the deltaic flats of the Mahanadi and the Kistna the plain is interrupted by many small hills or inselbergs consisting of the same ancient rocks as the plateau. Mangrove swamps occur along the deltas.

The east coast south has a broad stretch of flat land near the sea which consists mainly of alluvium. Further inland small hills appear which are of ancient crystalline rocks like those of the plateau.

Cities and Towns of Bombay Province: Aspects of Urban Geography

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[*Note*: Increasing urbanisation is a general feature of modern Civilization. While natural barriers as mountains, river crossings, deserts, conditions of water supply, and natural route concentrations were some of the geographical factors influencing the urban development in the past, Industrial and Commercial Expansion, Administrative and Social Centralisation have become the new forces in the evolution of Modern Urban Agglomerations. In U.S.A. and to some extent in Western Europe, Town is essentially a modern phenomenon. This paper aims at explaining the geographical factors underlying the evolution of towns of the Bombay Province (including Gujarat, Deccan and S. M. C. States). The discussion is on regional basis. "Cities" with a population of one lac and over or those which have been declared as "Cities" by the Local Government, and "Towns" with a population of ten thousand and over, have been studied in detail, with an outline reference to their site, "Economic base," and evolution. "Towns" having a population below ten thousand have been considered only for the purpose of determining the "Urban Zones."]

That the Bombay Province is the most urbanised of the major provinces of India is shown by the fact that the total urban population of the Province is 22.6 per cent of its total population, while the figures of other provinces range between 20 per cent and 3.4 per cent of their respective total population.[1]

This urban development of the province is naturally due to the growth of the city of Bombay and the cities and towns of Gujrat, Deccan and Karnatak. Geographically, as Vidal de la Blache points out, considerations of defence, natural barriers like

1. *Census of India*, Vol. I, page 46. For the purpose of regional survey Gujrath and S.M.C. States have been taken into account.

deserts, mountains, rivers and natural route concentrations and administrative centralisation form the purely local influences which determine the "siting" of cities,[2] while considerations of "space relation" constitute the larger environment which shapes the growth of urban areas and determines their tone. But these environmental factors themselves are liable to change from time to time, and in fact urban development in every country is characterised by such changes.[3] A study of urban geography therefore must take into account not only the problem of "siting" but also factors of larger environment like social needs and communications.

HISTORICAL EVOLUTION OF THE BOMBAY TOWNS

Historically, defence and commerce by land and sea routes, have been the major influences in the origin and development of our towns. The first urban development in Bombay was essentially coastal. The ports of *Honawar, Chaul,, Bassein, Broach, Balsad*, and *Cambay* are mentioned in the historical accounts of Hindu India as prosperous commercial centres trading with the Persian Gulf and often bearing the seats of local government. In the interior however defence and administrative convenience determined the pattern and evolution of towns. From North to South, *Kaira, Kapadwanj, Godhra, Baroda, Nasik, Kolhapur*, and *Badami*, were capitals of Hindu kings. Commercial centres were very few. Only *Dohad* a 'border' town between Malwa and Gujrat, *Lunawada* at the junction of routes through Malwa and Gujrat, *Kolhapur* "entered by nine roads" and mentioned as "Tagar" by Ptolemy, and Badami where there was a chamber of commerce in Chalukyan times, are mentioned as leading trade centres.[4]

With the rise of the Bahmani and Mogul power urban interest shifted further East in the interior. *Bijapur* and *Ahmadnagar* in the South, and *Malegaon* and *Ahmadabad* in the North rose to importance. Khandesh developed the Commercial centres of *Nandurbar*—where the English established their factory as early as in 1616—*Dhulia* and *Jalgaon* and the famous handicraft centres of *Yeola* and *Dharangaon*, mainly because Khandesh tract linked through the Satpura range, the Imperial capital of *Delhi* with the

2. P. Vidal de la Blache: *Principles of Human Geography*, page 473.
3. Jones and Bryan: *North America*, p. 364.
4. *Bombay Gazetteer*, Vol. XIV, p. 306.

rich commercial provinces of Southern Gujrat, where the trade with the Persian Gulf and the Makka Pilgrimage had developed the famous port of *Surat*. Similarly other ports of Gujrat had their share of prosperity when the trade of the Malwa and Central India tracts began to pass, under the Imperial rule, through them.

Maratha rule did not influence urban development to any great extent although the rise of defensive sites like *Satara* and various minor towns selected by the Maratha chiefs and local powers, as administrative centres must be mentioned. It is significant to note however that only *Chopda* and *Vairag* are mentioned as new commercial centres during this period.

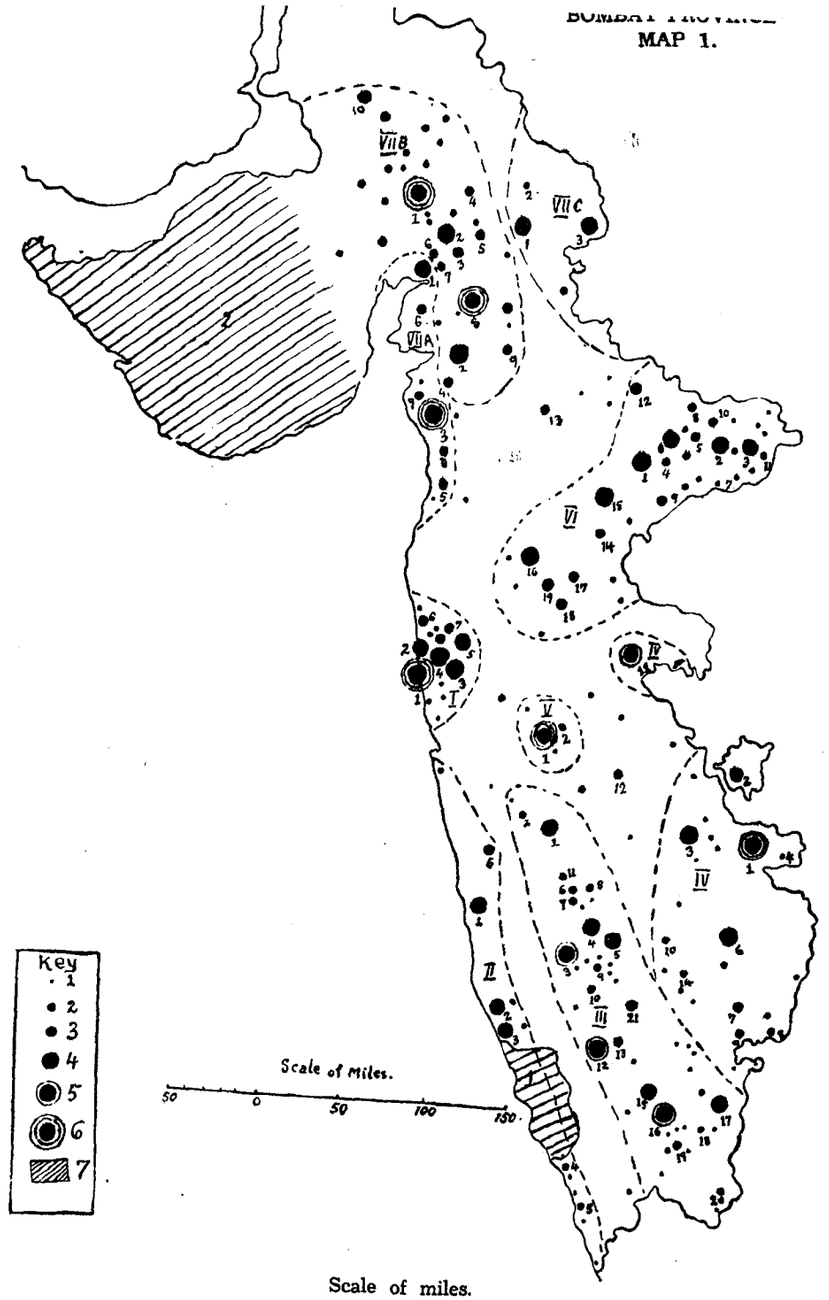
DEVELOPMENT OF THE BRITISH RULE AND GROWTH OF COMMUNICATIONS

Development of the British rule and growth of road and rail communications brought about a great transformation in the relative importance of different towns. Initially, establishment of English factories in Gujrat and Konkan gave a stimulus to the ports of *Surat, Bombay, Chaul* and *Karwar*. But it was followed by increasing monopolisation of maritime trade by *Surat* and *Bombay*. There was a corresponding decay in all other ports and this in its turn injured in no small measure the ancient prosperity of Gujrat. Construction of North and South roads in the interior gave a new stimulus to the settlements at the junction of the Ghats and the Eastern Plateau. Railways again, particularly in the Khandesh region, favoured the urban growth and created prosperous urban centres at nodal points.

In explaining the rise of modern cities Munro points out that "steam, steel and credit have made the modern city possible;"[5] in Bombay Province credit has certainly been an important factor, but the influence of industrialisation over urban growth is limited in extent. The growth of three cities only can be attributed to industrial expansion. The average urban settlement of the Province is a commercial town usually with a historical background and often now supported by administrative and social centralisation. This is clear from the following regional analysis which gives us seven well demarcated urban zones.

5. Munro: *En. of Social Sciences*, article on 'City.'

MAP 1.



Scale of miles.

1. Towns under 5000; 2. Towns between 5000-10000; 3. Towns between 10000-25000; 4. Towns between 25000-50000; 5. Towns between 50000-100000; 6. Towns over 100000 and 7. 1. Goa; 2. Kathiawar States.

1. Bombay Metropolitan Region; II. The towns of the Konkan Coast; III. The S.M.C. and Karnatak Zone of Contact Towns; IV. Sholapur Industrial Region; V. Poona; VI. The Khandesh Zone of Commercial and Industrial Towns; VII. The Towns of Gujrat:—(a) The Ports of the Gulf of Cambay; (b) Nodal points of the Interior; and (c) The 'border' towns connecting Gujrat with Central India.

1. THE BOMBAY METROPOLITAN REGION

The transfer of the Salsette area to the East India Company and the change of the Company's headquarters from Surat to Bombay, brought the Island into prominence, and now along with Calcutta it is the foremost of the Indian cities. The rise of the port was due to the Thana creek. Less than five fathoms deep, its main advantage has been the protection it gives to the harbour from the open sea. Railways and roads constructed during the period 1852-1885, like the arms of an octopus, created a vast hinterland to the port, and gave it a complete monopoly of trade of the major part of India. The American Civil War and the extended cultivation of Indian Cottons created a local textile industry, the causes of localisation being financial enterprise by local merchants, ease in transport of cotton from Gujrat, Khandesh and Karnatak, and economical import of sea-borne coal from Durban. Administrative centralisation, educational institutions, social amenities, and a high proportion of earning population, have further contributed to the growth of the city; and in spite of the defective localisation of the Cotton Industry,[6] the competition of *Ahmadabad* and *Sholapur*, and the development of Cochin and the Kathiawar ports, Bombay is not showing any material decline in its urban character.

A great increase in population has resulted in rise of land values, and crowding within the Island, which exhibits all the characteristics of a great metropolitan city. "Fort" is the central "core" where administration and commerce find their localisation.[7] In its neighbourhood are the fashionable shopping and amenity centres such as cafes and cinema houses. The tapering southern end of the island is marked by residential and governmental buildings. To the north of this central core, begins a continuous thickly populated area in the centre developed on religious and community basis. Along the Eastern coast is the harbour side with its docks, depots, whole-sale grain markets and oil installations, while the Western shoreline is dotted by rich residential dwellings owing to the advantages of the Western breeze and vantage points on the hills.

Further north lies the industrial zone of Bombay with its mills, railway workshops and ancillary industries and the working class

6. Vakil, Bose and Deolalkar: *Trade and Industry in Modern India*, p. 134.

7. P. Vidal de la Blache: p. 476.

area. Pressure of population and limitations of space within the Island were mainly responsible for the Backbay Reclamation, but suburbanisation has proved the real solution. The first suburbs were developed on the Northern edge of the Island. Railways and their subsequent electrification have thrown open a much greater area for suburbanisation and the growth of "satellite" towns, which are mainly "dormitories" and residential areas of the middle class population. Such are the suburbs of *Bandra, Santa Cruz, Andheri, Malad,* on the B.B.C.I., and *Kurla, Ghatkopar, Thana,* on the G.I.P. joined together in a network by a "ribbon" development throughout.[8]

A recent trend of much interest is the rise of a variety of industries in the suburban areas owing to the natural tendency of the manufacturers and importers of avoiding high customs duties on "completely manufactured" goods, the high land rents in the city, and dockyard charges, without sacrificing, however, the advantages of finance, trade, and commerce, that the city affords. Such are, to mention a few, the motor works at Sewri, match factory at Kurla, Chemical Works at Ambernath. Evidently Bombay is showing all the signs of a future conurbation, which will absorb the satellite towns of *Bassein,*—once an ancient and prosperous port,—*Bhiwandi, Kalyan* and other minor settlements.

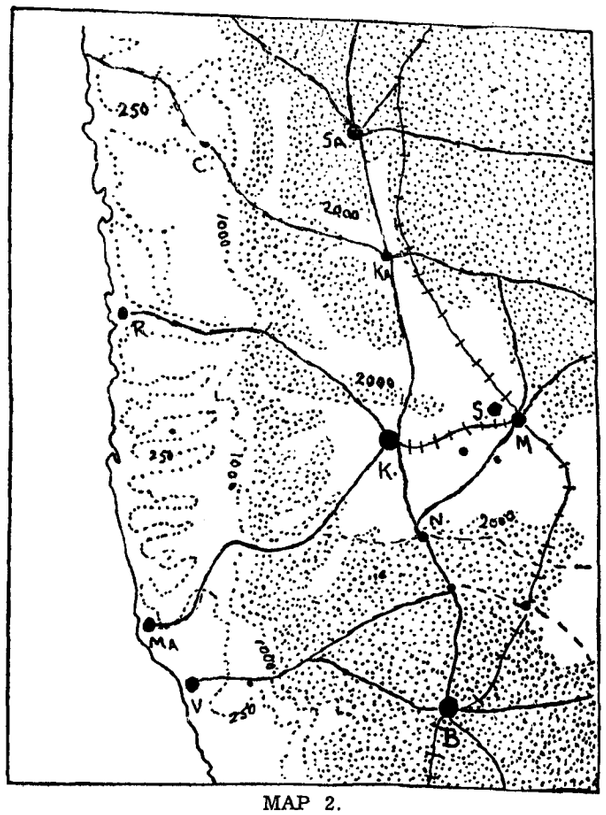
A feature of the Bombay Metropolitan Region is the complete absence of urban development on the Kolaba Coast beyond the Creek. It must be explained as mainly due to the absence of facilities in land and water communication between the Island and the Coast of the mainland.

2. THE TOWNS OF THE KONKAN COAST

South of Bombay lies a string of little ports along the Konkan coast, once prosperous in a maritime commerce, but now mere appendages to the Metropolitan City, *Chaul, Bankot, Vijayadurg, Karwar, Kumta, Honawar,* and *Bhatkal,* which were famous as ports in the Hindu and Mahomedan period. A glimpse into their prosperity during the early British period can be had from the accounts of travellers and of the East India Company's servants who were put in charge of the factory set up by the Company in this region.

8. Unstead: *A Systematic Regional Geography*, Vol. I, p. 74.

Mouths of the Konkan rivers were favourable sites. Products of the Deccan Plateau and Ghats as the famous "Kumpta" cotton and spices were transported by land routes across the Ghat passes and shipped to Arabia and the Mediterranean through these ports. With the progress in oceanic navigation, Bombay proved a serious rival. The old ports were inadequate to modern navigation. Development of off-shore bars across the creeks and river mouths and heavy silting have further reduced the utility of these ports. Karwar retains some of its natural advantages and it would have maintained its prosperity, had the plan to connect it by rail to Dharwar and Hubli in the sixties of the last century materialised.[9]



MAP 2.

Towns of the Konkan Coast and the 'Contact' Zone of S. M. C

B. Belgaum;	K. Kolhapur;	N. Nipani;	SA. Satara
C. Chiplun;	M. Miraj	R. Ratnagiri	V. Vengurla.
KA. Karad;	MA. Malwan;	S. Sangli;	

9. *Kanara Gazetteer*, p. 26.

In the interior, the towns of *Pen, Mahad, Chiplun* and *Rajapur,* owed their rise to their position as "Gap" towns controlling the Ghat routes from the Konkan side, where in the days of cart traffic they were the halting places to cart caravans. Railways on the Plateau and the development of motor traffic mainly at the expense of the age-old cart traffic, have now rendered them unimportant.

The coastal towns of *Ratnagiri, Malwan* and *Vengurla* however owe their stable position to their being administrative and educational centres. *Vengurla* like *Karwar* and *Honawar* has also a good coasting trade.

A striking fact about the Konkan region is that in spite of the great density of population, urbanisation has taken little root.[10] The disintegrating influence of relief, absence of good hinterland, railway development on the Ghats and general poverty of the population must explain this phenomenon.

3. THE SOUTHERN MARATHA COUNTRY AND KARNATAK ZONE OF CONTACT TOWNS

This region offers an interesting corroboration to La Blache's generalisation that the line of junction between two contrasted natural regions promotes a string of settlements which brings the two regions into mutual economic contact by means of commercial functions. *Karad, Kolhapur, Sangli, Nipani, Belgaum, Dharwar, Hubli, Haveri* and *Ranebennur* are primarily commercial centres situated at those nodal points where the Trunk road from Poona to Bangalore meets the commercial routes from East to West. From the point of local commerce, they are the "bottle necks" through which the products of Konkan must exchange with those of the Desh tract. From the point of inter-provincial and foreign trade they are the feeders of Bombay, where local produce is collected and despatched by rail by the agents of Bombay merchants. *Kolhapur, Sangli, Belgaum* and *Dharwar* are also administrative centres. Hubli with its population of ninety thousand owes its rapid progress partly to commerce but mainly to cotton industry, and the railway workshop. Railway has strengthened this commercial bias and the nodality of all these towns. *Satara* and *Gadag* are two outliers of this zone, while minor towns like *Tasgaon, Jam-*

10. Eg. the Karwar Taluka has a population of 64105; and a density of 229 persons per square mile.

khandi and *Mudhol*, retain their urban appearance because these are the chief towns of the S.M.C. States chosen by their rulers in Maratha days as defensive positions. Others like *Islampur* and *Rabkavi* are local commercial centres many of which were known for their handicrafts.

4. THE SHOLAPUR INDUSTRIAL REGION

Within this region lie the Industrial city of *Sholapur*, the commercial centre of *Barsi*, *Pandarpur*, the famous place of pilgrimage and the historical towns of *Ahmadnagar* and *Bijapur*. There are minor commercial centres as *Athni* and *Baglkot*, and towns of *Guledgud* and *Ilkal* famous for their handwoven textile products. Only Sholapur is industrial but other towns are grouped in this zone mainly because they are in intimate economic contact with this city. Seasonal migration of the Bijapur population to *Sholapur* and establishment of ginning factories in these towns bring them closer to *Sholapur* than to any other city.

The rise of *Sholapur* has been sudden and remarkable. In 1851 it had a population of thirty thousand,[11] when it was a commercial town. The opening of S.E. branch of G.I.P. Railway made it a cotton collecting centre. Cotton from the surrounding regions, a cheap local labour supply and ease of transport were the factors favourable to localisation and expansion of the Cotton Textile industry. The steady and rapid rise of *Sholapur* after 1900 must be therefore attributed to this industrial expansion. With a population of a lakh and a half to-day, it has the distinction (?) of being the only city of the Province predominantly depending on industrial activities.[12]

Barsi, on the political border, has considerable transit trade between the British and Nizam's territories. *Pandharpur* like other religious centres is showing signs of slight decline. *Bijapur* the capital of the Adilshahi kings had its heyday when it was according to Mandelslo one of the greatest cities in the whole of Asia in 1638.[13] Aurangzeb's sack of the city and the subsequent Maratha raids reduced it to a settlement of ruins. Under the British rule, its selection as District Headquarters in 1876 was the

11. *Sholapur Gazetteer*, p. 489.
12. *Census of India*, Vol. IX, 1921, p. 78.
13. *Bijapur Gazetteer*, p. 587.

main cause of its revival. Commerce followed in the wake and only during the last three decades has it returned to the stage of being called a town.

5. POONA

To the north of the S. M. C. zone lies the famous historical city of *Poona*. If Munro's description of the modern city as "an endlessly complicated phenomenon" is to be applied to any city of the Province, it holds true of Poona.[14] It is the historical and cultural centre of Maharashtra. Brought into prominence by Balaji Baji Rao Peshwa as his capital, it was still a union of four or five villages in 1757, according to Du Perron, with a common market and some one-storeyed houses. The later conquests of the Marathas brought fresh glory to their capital. Welsh in 1801 describes it as a city with a population of six lakhs, rich, gay, and prosperous. But the fall of the Marathas seems to have brought down a very rapid decline. Hamilton in 1820 speaks of Poona as a city of 150,000 persons. Jacquemont twelve years later describes it as a dirty city with a population of fifty thousand. But since 1872, with the growth of communications and administration, the historical factor has been supported by other influences; and now as the seasonal seat of the Provincial Government, as a cantonment town and a centre of trade and education, Poona is steadily growing in importance and absorbing the neighbouring settlements. Its population of ninety thousand in 1872 has risen to two lakhs and a half in 1931. Strangely enough modern industry, the most powerful influence in urbanisation, has remained practically unimportant and a variety of other influences has created the modern city.[15]

The site of *Poona* or *Punyapur* is an ancient one. Situated at the confluence of the Mula-Mucha, originally it had a beautiful natural setting. But it remained an average settlement till the time of the Peshwas. It was the charm of the surroundings and the more central position of the place in relation to the growing Maratha Empire, rather than considerations of defence, that induced Baji Rao to make it the Peshwa capital. But now due to influences, administrative and cultural in nature, Poona has outgrown

14. Munro: *En. of Social Sciences.*
15. *Census of India* 1921, Vol. IX, p. 75.

the original site, and the 'Greater Poona' now absorbs the towns of Kirkee, Bhamburda, Yerrowda and Cantonment area. Again the old core of Kasba remains distinct as centre of trade and site of the Peshwa administrative buildings. Civil administration and cantonment have created a large middle class. Educational facilities and historical associations of the city have induced the 'Pensioners' to make Poona their permanent home. A variety of industries, fashionable shops and hotels have sprung up under the patronage of this class, and the economic base of the city to-day is really complex.

6. THE KHANDESH ZONE OF COMMERCIAL AND INDUSTRIAL TOWNS

Considering the density of population, the degree of urban development in this region is surprising. Historical causes for the evolution of towns have been already explained. Railway development and cotton cultivation, and good labour supply have promoted the urban settlements as commercial and of late as industrial centres. *Dhulia* was a fortified settlement before it was selected as District Headquarters by Briggs in 1848, and from 1878 only it began to assume its present urban form. *Bhusawal, Chalisgaon* and *Manmad* once average settlements[16] show how towns can grow rapidly when they are chosen as railway junctions. *Amalner, Dharangaon* (where the famous 'jinifaf' cloth used to be produced in the Mughal days and where there was an English factory) and *Jalgaon* owe their rise to the modern textile industry.

Nasik and *Malegaon* are outliers of this zone. On the highway between Bombay and Central India, these are commercial centres, although in the past defence was the chief factor in their growth.

7. THE TOWNS OF GUJRAT

Gujrat has played a great role in the past. As a rich agricultural land characterised with centres of famous handicrafts, it

16. In 1872 Bhusawal and Chalisgaon had a population of 6804 and 3914 respectively; Manmad had a population of 3790 in 1881.

attracted the attention of many invaders. Its position in relation to *Delhi* and Central India, the maritime benefits derived from the Gulf of Cambay, and the broad river mouths which afforded suitable sites for ports, were responsible for its high commercial prosperity in the pre-British period. Great urban development therefore was a natural result of this prosperity.

Regionally from the coast onwards into the interior, three types of urban agglomerations may be distinguished:

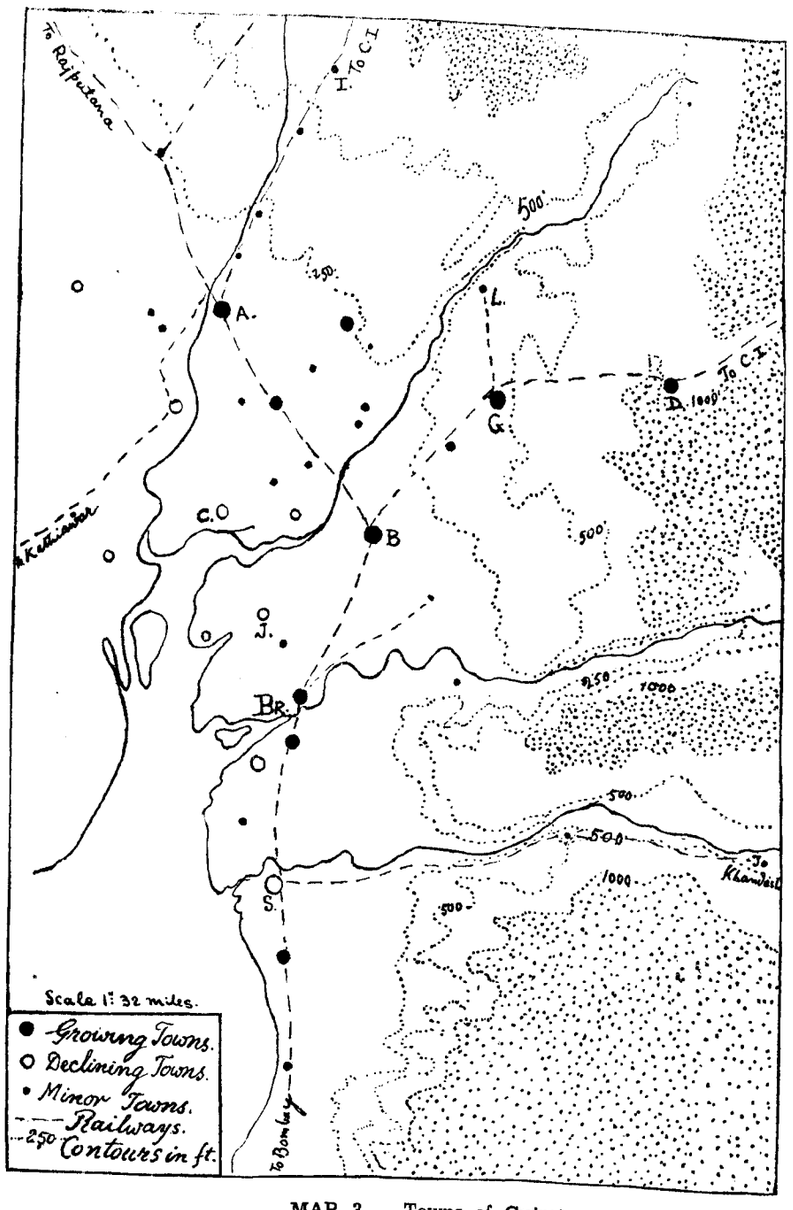
(*i*) The ports of the Gulf of Cambay; (*ii*) Nodal points of the interior; and (*iii*) the 'border' towns connecting Gujrat with Central India.

(*i*) *The ports of the Gulf*:—Almost every important river mouth has witnessed the rise of a port, obviously due to advantages of site and hinterland. *Surat, Broach* and *Cambay* rose to importance owing to the possibility of navigating larger vessels into their harbours, while others remained more or less as feeder ports depending on a coasting trade.

Cambay at the mouth of the Mahi has a long history of prosperity. The rich flat doab between the Sabarmati and Mahi was a good hinterland from whence used to be exported agricultural products like rice, coconuts, mangoes and articles of luxury like ivory, carvings, lacquer work, silk and gold thread, and 'Cambay' stones. Its imports consisted of gold and iron, perfumes and spices, and woollen cloth. The gradual silting up of the Mahi and the rise of *Surat* in the 17th century reduced its trade considerably and its former glory was further destroyed by the railway construction of the 19th and 20th centuries, which has diverted the traffic and trade through *Anand*. Even in 1880 it was described as a town with "dull trade and few industries."[17]

Broach like *Cambay* is an ancient port. Situated on the right bank of the Narmada and with a rich hinterland it became the natural outlet for Southern Gujrat. Commerce encouraged many local handicrafts. As a seat of Hindu Kings, it was later strengthened by a fort. But its decline seems to have set in very early in point of time due to silting of the river mouth. In 1777 it is spoken of as a large town with fifty thousand souls. In 1812 its population declined to thirty-seven thousand. In recent times railway and administration have somewhat arrested its

17. *Bombay Gazetteer*, Vol. VI, p. 241.



MAP 3. Towns of Gujrat

A. Ahmadabad; BR. Broach; D. Dohad; I. Idar; L. Lunawada; B. Baroda; C. Cambay; K. Godhra; J. Jambusar; S. Surat.

decline. Population has increased during the last fifty years and inland trade has restored a part of its former prosperity.

Surat.—Situated on the left bank of the Tapti, the famous factory town of Surat has an interesting position. The bend of the river near its mouth has given the harbour a sheltered position and the city is situated on a slightly rising ground along the bank. It rose to importance only in the Mughal times when the land routes from Golkonda, Burhanpur, Agra and Allahabad and the sea routes from Ceylon, Madras and Bengal were developed. Its prosperity as an "Emporium of trade" led the English to found their factory in 1612. Accounts of European travellers and merchants tell us that the city reached its peak prosperity in 1658-1707. Then followed an unsettled period during which Surat had chequered history. In the later period although the decline of the Mughal Empire adversely affected the city, under the English management its trade and commerce were maintained till the rise of Bombay and the beginnings of the railway era. Its decline was also due to the silted mouth of the river which gradually became unsuitable even to the larger sailing vessels before the days of steamships. When the port could not receive larger vessels, *Rander* stole a part of its trade. But its importance was partly restored when *Swally Roads* directly at the mouth of the river was developed by the East India Company as an auxiliary port from which goods from ocean-going vessels used to be shipped in small crafts to the port proper. To-day, however, it is more or less a stagnant city with a variety of industries, partly depending on its historical inertia and the new administrative developments.[18]

The minor ports of *Tankari, Rander, Navsari* and *Billimora* are hardly of any importance than as straggling towns depending on coastal trade.

(ii) *Nodal points of the interior.*—In the interior we come across a zone of towns which owe their rise to favourable river-crossings and nodality in communications. The urban agglomerations of *Ahmadabad, Baroda, Patan, Mehasana, Dholka, Kaira, Nadiad, Anand, Kapadwanj, Urmeth* and *Dabhoi* are primarily such commercial centres.

18. *Census of India*, 1921, Vol. IV, p. 74.

Ahmadabad:—Situated on the left bank of the Sabarmati, Ahmadabad is the second major city of the province. Its early urban growth was due to its position as the first suitable and direct crossing by the northern route from Central India to Gujrat and Bombay.[19] Under the Mughals it was the flourishing capital city of Gujrat Subha having a large trade with other parts of the Empire. It was a home of famous handicrafts. Its fortunes declined with the fall of the Empire, and by the beginning of the British rule, it was in a state of decay. Since the last quarter of the 19th century, however, it has switched itself on to new prosperity. Localisation of textile industry has again brought the city into prominence and it can boast of a population of three lakhs. As a commercial centre it enjoys an advantageous position. Rich cotton tracts in the neighbourhood, good labour supply, and a commercial class full of enterprise have created a Cotton Textile Industry which may soon outstrip even the Bombay Textiles.

The town within the old city walls with its characteristic 'Pols', remains a distinct and densely crowded unit. Outside the walls the city has extended practically on all sides but particularly along the Sabarmati. Rail and road bridges across the river have brought the other bank of the river within easy reach, and extension along this side is also taking place.

A reference to the comparative table shows us that Ahmadabad is primarily getting industrial. Industry has promoted other aspects of urban life, and with its industrial and social background, Ahmadabad, like Poona in Maharashtra, represents the culture and prosperity of Modern Gujrat.

Baroda.—Baroda with reference to its site and functions, occupies a similar position to that of Ahmadabad. The major portion of its prosperity is due to its being the capital of a leading Indian State. Other centres in this zone are commercial towns and naturally their progress is mainly due to Railway development.

(iii) *The Outer Zone of the 'Border' Towns*.—This outer or Eastern zone of towns mainly consists of those settlements which owe their selection and rise to defensive positions and commercial depots. Most of them are on the hilly border which separates the region of Malwa and Central India from Gujrat, and as such these control the commercial and strategic routes between these two contrasting regions. Such are the towns of *Idar*, *Lunawada*, *Jhalod*, *Dohad* and *Godhra*. Most of these became fortified towns under local chieftains because of their strategic position in guarding the routes. Most of them were in good state of prosperity, but railways have now conferred unequal benefits over them. In general the Ahmadabad routes of the B.B. & C.I. and the Khandesh route of the G.I.P. and the Tapti Valley Railway have made this tract commercially unimportant. From the point of local commerce railways have conferred a boon upon Godhra by making it a nodal point, but have snatched the prosperity of Dohad when the line was carried up to Ratlam; and except for Godhra in these days, other towns are retaining their urban appearance solely because they are the administrative centres of the smaller Indian States of Gujrat.

19. *Ahmadabad Gazetteer*, p. 250.

MAIN TRENDS IN URBAN DEVELOPMENT.

Finally it is interesting to notice the main trends in the urban development of the Province. In the larger equation between Man and Nature, the urban agglomeration has played a decisive role in human history. The 'City' ancient and mediaeval, represents yet another human attempt to overcome the forces of Nature by systematic co-operation and corporate living. Its modern successor too, true to its economic environment shaped by industrial revolution, represents a 'large scale' attempt to harness the forces of Nature. But there is a difference. While a natural obstacle or the need for defence determined the site of the city in the past, the modern city of the American type, as La Blache points out, is a creation of preconceived planning.[20] The urban agglomerations of the Bombay Province obviously belong to the former category, though, it must be conceded, they are much smaller units than the cities of the West. (i) Most of them owe their origin to defence or commerce. Only later, they gained administrative and very often religious importance. Their progress, however, due to a variety of causes, was necessarily slow, and even to-day they remain towns of moderate size. (ii) But in the modern period, their economic base has undergone a good deal of transformation. Administration and social

20. *Principles of Human Geography*, p. 478.

centralisation have become greater bonds of urban cohesion than defence or commerce. But each of these forces, in their superimposed pattern, has left its impression on the average town. A dilapidated fort, an old but partly revived "Peth"—market—, a prominent but partly neglected temple, the vestiges of the past prosperity, and administrative offices such as the Collector's or Mamlatdar's Katcheri, schools and modern shops, the marks of modern time, characterise almost every town of the Province. (iii) Industry, however, in spite of the impact of the West, has not contributed much to this urbanising process. Only *Sholapur* may be called a truly 'industrial' city. Other cities are composite pictures where one urbanising factor is overlaid on the other, with the general result that the city presents a 'blotched' appearance. (iv) Cities with industrial bias have recorded a substantial growth. In two types of urban agglomerations, prosperity based partly on commerce but mainly on industry is in evidence. (a) The cities of *Bombay, Ahmadabad, Sholapur* and *Hubli;* and (b) The towns of the Khandesh region. (v) But two zones of decay are also discernible: (a) The Gujrath ports which have practically succumbed to the influence of Bombay; (b) A belt of towns in the S.M.C. tract from *Islampur to Guledgud* the decline of which is difficult to account for. Isolation from railways and decaying handicrafts in certain cases, seem to be the main causes. (vi) To the general impression that there has been an exodus from the rural areas to urban centres statistics lend little support. Although there have been many changes in the relative position and importance of many urban settlements, the percentage of the total urban population to the total population of the region has not materially changed during the last fifty years.[21]

21. *Census of India*: pp. 38-41.

APPENDIX A.

Towns (1931)

According to zones (Towns with a population of 10,000 and over

I. *Bombay Metropolitan Region*

(1) Bombay 1161383; (2) Bandra 43290; (3) Kurla 30311; (4) Kalyan 26291; (5) Thana 21816; (6) Bassein 12689; (7) Bhivandi 15617; (8) Villeparle 11290.

II. *The Towns of Konkan Coast*

(1) Ratnagiri 23906; (2) Malwan 29817; (3) Vengurla 20158; (4) Karwar 16122; (5) Kumta 14534; (6) Chiplun 13056.

III. *The S.M.C. and Karnatak Zone of Contact Towns*

(1) Satara 26379; (2) Wai 11760; (3) Kolhapur 69860; (4) Sangli 29818; (5) Miraj 26465; (6) Karad 14479; (7) Ashta 11251; (8) Tasgaon 110111; (9) Inchalkaranji 11904; (10) Nipani 17857; (11) Islampur 10737; (12) Belgaum 41890; (13) Shahapur 11704; (14) Jamkhindi 15523; (15) Dharwar 41671; (16) Hubli 89982; (17) Gadag-Betgeri 45852; (18) Laxmeshwar 10622; (19) Savnur 10933; (20) Ranabennar, 16,967; (21) Gokak, 11,866.

IV. *Sholapur Industrial Region*

(1) Sholapur 144654; (2) Barsi 27610; (3) Pandharpur 29460; (4) Akalkot 10851; (5) Mangalwedhe 10539; (6) Bijapur 39747; (7) Bagalkot 15597; (8) Ilkal 14267; (9) Guledgud 16756; (10) Athni 13561; (11) Ahmadnagar 41890; (12) Baramati 14170.

V. Poona (City) 198078; Kirkee 16302

VI. *Khandesh Zone of Commercial and Industrial Towns*

(1) Dhulia 39939; (2) Jalgaon 34375; (3) Bhusaval 27989; (4) Parola 12277; (5) Dharangaon 18542; (6) Amalner 23491; (7) Chalisgaon 16808; (8) Chopda 18434; (9) Erandol 12382; (10) Yawal 12751; (11) Nasirabad 14753; (12) Shirpur 10938; (13) Nandurbar 16919; (14) Manmad 12277; (15) Malegaon 32462; (16) Nasik 48704; (17) Yeola 16751; (18) Sangamner 15355; (19) Sinnar 10773.

VII. *Towns of Gujrat*

(i) Ports of the Cambay Gulf:—(1) Cambay 31877; (2) Broach 34276; (3) Surat 98936; (4) Ankleshwar 12023; (5) Balsar 19481; (6) Jambusar 11734; (7) Rander 12344; (8) Navsari 14937.

(ii) Nodal points of the interior:—(1) Ahmadabad 310000; (2) Nadiad 34584; (3) Anand 11660; (4) Kapadwanj 16536; (5) Umreth 14779; (6) Borsad 13191; (7) Dholka 13743; (8) Baroda 112860; (9) Nandod 11236; (10) Mehsana 10393.

(iii) Eastern Gujrat:—(1) Godhra 35110; (2) Dohad 22093; (3) Lunawada 11896.

APPENDIX B

CITIES OF THE PROVINCES

Growth of Population: 1881-1931

	1881	1921	1931
Bombay ..	773196	1175914	1161383
Ahmadabad ..	137041	274007	313789
Poona ..	144340	214796	250187
Surat ..	109844	117434	98936
Sholapur ..	59890	119518	135574
Hubli ..	36673	69206	89982

APPENDIX C

OCCUPATIONAL DISTRIBUTION OF POPULATION

(Per 1,000 of population)

	Bombay	Ahmadabad	Poona	Sholapur	Surat	Hubli
Agriculture	1%	36	83 (88)	65 (80)	28	137
Industry	25%	514	194 (271)	546 (671)	467	137
Transport	6·4%	25	58 (43)	37 (33)	24	128
Trade	11·8%	205	146 (116)	110 (72)	202	200
Professions	2·2%	18	52 (61)	26 (19)	71	36
P. Administration	2·7%	17	73 (81)	20 (22)	21	24
Domestic service	3·8%	58	66 (61)	15 (28)	53	13

(N.B. :—1.—Figures relating to occupations "Insufficiently described" have not been included.

2. Figures relating to Bombay are shown on percentage basis and are exclusive of the number of dependents.

3. Figures are based on the 1921 Census when an Industrial Survey was undertaken in the cities. Similar figures are not available in 1931 Census except in case of Poona and Sholapur (which are given here in brackets).

GENERAL REFERENCES:

1. *Imperial Gazetteers.*
2. *Gazetteers of the Bombay Presidency.*
3. *Indian Year Book*, 1940.
4. *Census of India*, 1921, Vols. VII, VIII and IX.
5. *Census of India*, 1931, Volume I.
6. *References to Municipal Boroughs.*

*The Aborigines of the Tarai Region

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Lying at the foot of the Siwaliks and the outer Himalayas, though not separated from the plains to the south by any well defined feature, the Tarai Region is a separate geographical unit. It is different in its climate, soil, structure and even the people who inhabit it.

The basic population of practically the whole country consists of a dark, short and broad-nosed race, with wavy but no woolly hair. In the east and north-east of India its identity has been obscured by the filtration of Mongoloid race through Sikkim and the Brahmaputra valley. In the Gangetic plain the type is traceable throughout the population, and the element grows in strength towards the east.

"The only immigrating race of practical importance is that of the Aryans, whose advent and progress are indirectly, and to a great extent conjecturally, revealed in the collection of their invocation handed down from perhaps as early as 3,000 B.C. in the Rig-Veda."

It appears that a number of conjugate tribes of northern race and pastoral habits migrated into the Punjab, where they settled after dispossessing the dark tribes in occupation, relegating them to the position of slaves and helots, and forcing them to migrate to the more inaccessible parts in Southern India, the Chota Nagpur hills, or deep into the forests on the north-east. Very soon the Aryans lost touch with their original country and began to develop a new civilization in their new environments. The comparatively easy conditions of life in the sub-tropical circumstances, and the almost practical immunity from attacks and enemies "combined to soften the northern fibre of the race," and in course of time, the powers of the chieftain were transferred to the priest. Religion took the first place in their life and the Brahman got the absolute supremacy.

* Paper contributed to the Geography Section, the Indian Science Congress Session at Benares, January 1941.

But India was subjected to several such streams of invasion, each forcing the previous invaders to leave the settled area, and, becoming homeless, press their predecessors. They went deeper into the forests and formed colonies, while the Dravidians, adapted to forest life had to shoulder the brunt and to run before them. These Dravidians were not only ignorant of the art of agriculture and even domestication of animals, but were hardly in the stone age of civilization.

No two races of man, living in the same land for centuries, can possibly remain without coming into direct contact. The Dravidians mixed with the Aryans and produced the Aryo-Dravidian type, while those who had already receded too far to the north-east met the Mongoloid race and produced the Mongolo-Dravidian type.

The Tarai Region is inhabited by the Aryo-Dravidians in the United Provinces and Bihar and by the Mongoloids and the Mongolo-Dravidians in the region of northern Bengal. When the Aryans built the caste system under the Brahmans, these aborigines and the new types were classed as 'Shudras' and 'Mlecchas' and preferred to remain out of their reach rather than to meet with persecution at the hands of the fairer race.

The Aryo-Dravidians in the Tarai Region are represented by the Tharus, the Bhuksas, the Bhars, etc., of the Mongolo-Dravidian type we have the Kooch; while the Lepchas, the Limbus, the Mechs, the Khambus, etc., all belong to the true Mongoloid stock.

Sir H. H. Risley has described the three races mentioned above in the following words: In the Aryo-Dravidian type "the head form is long with a tendency towards medium. The average index varies from 72·1 in the Kachi and Koiri of Hindustan to 76·8 in the Dosadh of Bihar . . . . . The distinctive feature of the type, the character which gives the real clue to its origin and stamps the Aryo-Dravidian as racially different from the Indo-Aryan is to be found in the proportion of nose. The average index runs in an unbroken series from 73·0 in the Bhuinhars of Hindustan to 88·7 in the Musahar of Bihar. . . . . .The statstics of height lead to a similar conclusion. The mean stature of the Aryo-Dravidian ranges from 166 c.m. in the Bhuinhars to 159 c.m. in the Musahars, the corresponding figures in the Indo-Aryans being 174·8 and 165·8. The one begins where the other leaves off."

"The Mongolo-Dravidian is one of the most distinctive types in India and its members may be recognised at a glance." The cephalic index "varies from 79·0 in the Brahmans of Bengal to 83·0 in the Rajbansi Magh . . . . The mean proportions of the nose range from 70·3 in the Brahmans and Kayasths to 84·7 in the Mals and 80 in the Kocch. The number of high individual indices brings out the contrast with the Indo-Aryans and points to the infusion of Dravidian blood . . . . The stature varies from 167 in the Brahman to 159 in the Kocch of the sub-Himalayan region."

"On the northern and eastern frontier India marches with the great Mongolian region of the earth. Neither Bengalis nor Assamese have any stomach for fighting, they submitted tamely to the periodical raids of the hill people, and the only check upon the incursion of the latter was their inability to stand the heat of the plains. They occupied, however, the whole of the lower ranges and held the 'Duars' or the gates of Butan. Thus in the eastern Himalayas none of the plains people made good their footing within the hills, which remains to this day in the exclusive possession of the races of the Mongoloid type.

"The prevalent head form is broad but the mean indices show some remarkable departures from this type. The Jaintia index is 72·9, and several tribes have indices between 75 and 80 . . . . . The mean (nasal) index ranges from 67·2 for the Lepchas to 86·3 for the Khasias . . . . Under the head of stature there is nothing much to remark. The Gurungs (169·8) are the tallest and the Miris (156·4) the shortest of the tribes included."

"Progress in civilization demands that the people raise a variety of food and raw materials, and accumulate a surplus on which to live while making new discoveries and taking new steps in advance." If one such step fails they should not die of starvation. It also demands that the people be able easily to travel about so as to get ideas and materials from other places and other people and to give them what they have attained. Energy is essential for progress, and strong seasonal contrasts necessary to stimulate activity and infuse energy.

It is therefore comparatively recently that the aborigines of the region have begun to practice what has been called by Huntington the "hoe and tree culture." "Such people drop the seed into the holes punched with a stick, and grub up the weeds with

a hoe, but do not employ animals to plough or cultivate the soil." Often they cultivate the field only for a year or two and then abandon it in favour of another which has been freshly cleared and burnt.

"One great hindrance to tropical and sub-tropical agriculture is the vast number of fungi, insects, birds and beasts which devour the crops or otherwise destroy them. In wet weather, however, not only is it difficult to manipulate the damp, sticky soil, but even when the roots are dug up they take root again at once. This fact together with the poverty of the soil, and its tendency to become sour or otherwise unfit through the accumulation of bacteria accounts for the prevalence of 'shifting agriculture' among the aborigines of all countries. They cultivate the field for a year or two and then abandon it. The first crop may be good, but the second is much less abundant, and the third may be scarcely worth harvesting. Even if the slight supplies of plant food are not exhausted and if the soil still remains sweet, the field may be completely clogged by grass. In certain areas even the work of clearing the new fields is very difficult. The nominally dry season is often so rainy that after the trees and bushes have been felled they do not become dry enough for burning before the genuine rainy season comes again. When that is over, so much new wood has grown that the work of clearing the land must be done all over again.

Even if the conditions are not so bad as all this, it requires a high degree of persistence, energy and intelligence to overcome the handicap of poor soil, bacterial diseases, insect pests and weeds." When the poor aboriginal has raised his crop, he has to face yet another set of difficulties which are absent in the cooler regions. The white ants, the mice and other rodents are too numerous and beyond the control of the poor primitive man with his earthen and wooden pots.

There still remains a factor which is always active against the primitive people in the tropical and sub-tropical regions, it is the variety and the quality of the food. This lazy and indolent type of man has got to depend on a very small number of food products, and in the selection of these the first consideration is the comparative ease with which they can be obtained. He never has any idea of the nourishing properties of different substances and simply takes them to satisfy the demon of hunger.

"The main trouble with the tropical fruits, however, is the excessive amount in which they are taken when available. Many a child may eat little except bananas for several days in succession." But the quality also counts. Almost every available stuff in the tropics is inferior in nourishing properties to those of the temperate regions. The banana, guava, or the mango cannot compare with the apple or the orange. The cereals too are inferior. "Millet, maize, or even rice are starch foods, by no means so well balanced as rye, barley, wheat or oats." Meat could compensate for several deficiences, but their all-devouring habit makes them take it raw or putrid and rotten. The excessive quantity of ale that they consume is more harmful than anything else. Childbirths, christenings, marriages, deaths, sowings and reapings of crop, etc., are all accompanied by ceremonies in which wine is freely used and in which its excess is appraised.

Over and above all these handicaps comes their superstition. If a man falls ill he suffers from 'evil eye' or the anger of some God has got to be propitiated by worship or sacrifice. A contagious disease is the greatest havoc with them, for the biggest sacrifice and the most tiring worship will not remove it.

Living under such unavoidable circumstances, toiling under such odd handicaps, and labouring against such natural forces it is no wonder that the poor Tharus, Bhars, Bhuksas, Lepchas, Limbus, Mechs, etc., have remained so backward in their arts and crafts, agriculture and industries, religion and culture.

Ethnologically the tribes of the Tarai Region have been divided into the three types mentioned above, but culturally there can only be two divisions, and only one of these interests us here. The two classes are:—

1. Those who have become completely Hinduised, have settled down in villages, invite the Brahmans in their ceremonies, but who may still be recognised either by their occupation, some of their lingering customs, or a comparative freedom as regards the choice of food stuff. Such are the Koiris, Chamars, Dosadhs and Babhans.

2. Some of the more important members of this class will be dealt with in more detail. It comprises all the tribes who have remained more or less in the primitive and savage state.

They have continued with their bows and arrows, paganism and superstition. To this class belong the Tharus, Bhuksas, Lepchas, Limbus, etc.

In between these two classes we may place the Bhars, the Kocchs, etc., who are neither totally Hinduised, nor are they pursuing their old course.

It is very difficult to be accurate in dealing with the distribution of any of the aboriginal tribes. Sir H. H. Risley in '*People of India*' says that, "The leading men of an aboriginal tribe, having somehow got on in the world and become independent landed proprietors, manage to enrol themselves in one of the more distinguished castes. They usually set up as Rajputs, their first step being to invite a Brahman priest who invents for them a mythical ancestor, supplies them with a family miracle connected with the locality where the tribe is settled, and discover that they belong to some hitherto unheard-of clan of the great Rajput community . . . . till they have been absorbed in the fullest sense of the word, and henceforth pass and are locally accepted as high class Hindus."

It is, therefore, almost impossible for census enumerators to find out the caste of any man, but since we are concerned only with the portion of these aborigines who have not become complete Hindus this difficulty does not stand in our way.

In the descriptive ethnology that follows the influence of these factors may be noticed at every step.

Tharus

The Tharus inhabit the districts of Nainital, Kheri, Gonda, Bahraich, Gorakpur, Champaran, etc. Mr. Nesfield who has given an elaborate account of these people, says, "To the east they extend about as far as the river Kusi, where they come in contact with the Mechs, a tribe similar in habits and features, and inhabiting the portion of the Tarai which separates the plains of Bengal from the hills of Sikkim. To the west they extend as far as the river Sarda. At this they dovetail with another forest tribe similar to themselves in appearance and culture, the Bhuksas."

They claim to be Rajputs having lost their caste by degrading themselves as they indulged in intoxicating liquors, rearing fowls and eating pigs and boars. Crooke has classed them as

Mongolo-Dravidian and accounts for their origin as follows: "The most probable explanation based on the available evidence seems to be that the Tharus are originally Dravidians, who by alliance with Nepalese and other hill races have acquired some degree of Mongolian physiognomy." Risley in the Ethnographic Appendices to the Census of India, 1901 Report, Vol. I, has placed them in the Aryo-Davidian group. From the measurements of cephalic and nasal indices and of stature taken at the census, as well as from the habitat, it seems obvious that the conclusion drawn by Crooke as to the mixture of Mongolian blood in the Tharus to the extent of influencing their physiognomy to a marked degree, is not based on sufficient data. Mr. Nesfield, while writing of the Tharus of Gorakhpore says, "Owing to the intermarriages which have taken place within the last two or three centuries between Tharu men and Nepali women the physiognomy of the Tharu tribe has acquired, in some instances, a slightly Mongolian cast, which shows itself chiefly, but not to a striking degree, in slanting eyes and high cheek bones. In other respects their physical characteristics are of the strictly Indian type. In stature, build, and gait they are distinctly Indian and not Mongolian, nor have they any traditions which connect their origin with Nepal." Crooke has relied too much on the commendable monograph of Mr. Nesfield, quoted above, but has disregarded the fact that it refers only to the Tharus of Gorakhpur and it is not based on accurate scientific measurements.

Tharu marriages are settled by fathers. The father of the youth selects a girl and approaches her father with a present of wine. He makes his proposal for the price to be paid for her, and if the girl's father gives his consent he closes the negotiation by drinking from the present. The average price may be regarded to be Rs. 9 but with the approach of prosperity it is increasing. The Tharus are thoroughly exogamous in the selection of their wives. Child marriage is not very common and the correct age both for the girl and the boy is regarded to be above 17 years. Polygamy, divorce in the form of expulsion from the house of faithless wife with the approval of the council, widow marriage, levirate and exchange of wife in a spirit of mutual accommodation, both permanently as well as temporarily, are all allowed and freely practised.

Burial seems to have been the usual way in which the Tharus formerly disposed of their dead, but due to the influence of Hindu

neighbours, cremation is becoming more and more common except in the case when the death is due to some contagious disease. Immediately after death the corpse is bathed, painted with vermillion and kept outside the village for the whole night. After cremation the ashes are spread in the nearest river.

The religion of the Tharus, who have not been Hinduised, is based essentially on a belief in ghosts and consists of little else. Rev. S. Knowles, whose knowledge of the beliefs of the Tharus is unique, writes in his book, *Gospel in Gonda*, "When the last ray of light leaves the forest and the darkness settles down upon their villages, all the Tharu men, women and children huddle together inside their fast closed huts in mortal dread of these ghostly beings, more savage and cruel than the leopard, tiger and bear that now prowl about for their prey." . . . . "They have some idea of a Supreme Being they call Naravan, who gives them sunshine and rain and harvests, but they have no proper idea how this great, far off Being is to be approached or worshipped."

They live by hunting, and fishing, gathering forest fruits and vegetables, grazing cows and buffaloes, preparing 'ghi,' keeping pigs, fowls, bees and goats and practising a rude form of agriculture.

Rev. Knowles writes "Their chief fishing instruments are the hook and line, the net and the funnel-shaped basket." They used to catch fish by poisoning the water, but have now given up this practice. Their favourite root is a plant of yam species, which grows freely at the foot of the hills. Wild rice, the flower of the 'mahua' tree and the fruit of the wild fig tree are gathered in their several seasons. Until recently they used to cultivate in a rude way by cutting and burning down the jungle, but now they cultivate the transplanted rice throughout the Tarai, and they have a valuable source of food in the plantain which grows plentifully around their villages.

The Census of 1931 tells that they have made some progress in agriculture. In the United Provinces alone, out of 11, 433 male and 1,367 female earners as many as 9,873 males and 844 females are agriculturists: to this must be added the 909 males and 271 females who were returned as field labourers, woodcutters and those engaged in other allied occupations, and 235 males and 2 females returned as live stock breeders.

"The women do the largest part of the sowing, weeding and harvesting, while the men engage in fishing, hunting, etc., which they regard as the proper occupation for their sex. Their skill as elephant drivers is admitted everywhere and they are often engaged for that service. A number of Tharus work as labourers under the Forest Department as they are expert woodcutters and not a few are employed in the orange gardens of Butwal, and the digging of 'khas.' The women weave beautiful baskets from 'munj' and other reeds and cane.

"The tools and weapons used by Tharus are not made by themselves. The share of the plough, the point of the spear, the blade of the axe or hatchet, and the blade of hoe with which they dig the yam are all procured from lohars. The curved knife (*Khukhuri*) is procured from Nepal. They work in bamboo, reeds, and fibre and make baskets, snares and nets, and similar appliances for hunting and fishing," but these are mostly meant for their own use.

They make their houses from wood and grass, plastered with red mud outside. The cattle sheds are protected from beasts of prey by strong wooden palings. The houses are large, cool and commodious, and generally raised on poles, in order to protect the inmates from damp and malaria. Dr. Buchanan, in '*Eastern India*' remarks that "the huts of the Tharus have straight ridges, and in general are much wider and longer than those of other natives. On one side of the hut is usually a garden, neatly fenced and containing tobacco, mustard and a few plantain trees."

Every village is a self-governed unit, with a council of administration composed of the elders, presided over by the 'Barwaik,' who has lately adopted the title of Chaudhari under Hindu influence. The selection of the Chaudhari depends upon age, experience and knowledge of magical and medicinal arts. Mr. Nesfield observes that among themselves the Tharus are for the most part a peaceful and good-natured race.

Mr. Crooke describing their food stuffs says, "In Gonda they eat pork, and the flesh of deer and those cloven-footed animals which ordinary Hindus eat, fish, both scaled and scaleless, tortoises, rats and hares. They will not eat beef . . . . This is also the case in Gorakhpur . . . . In Gonda all Tharus will smoke together . . . . They make their principal intoxicating drinks from rice. This rice liquor is drunk more or less

every day, and every member of the family—from the oldest to the youngest—drink it." Rev. Knowles says, "They say by only thus drinking they can be kept alive in these forests, especially in the rains."

The Tharus are making some advance in the matter of education in Nainital district. At the last census some 762 were returned as literate including 19 women; many are 'patwaris' and some are supervisor 'qanungoes.' Till recently one was a Naib-Tahsildar. At the time of the last census one was an Assistant Manager of Co-operative Societies. But they are no more Tharus and have become Brahmanic Hindus.

Some 25,492 were returned in U. P. at the census of 1891 but the number had increased to 31,583 in 1931. They are distributed as follows: Nainital 20,753; Gonda 4,014; Kheri 3,624; Gorakhpur 1,635; Bahraich 1,531; others 26.

In Bihar, the district of Champaran alone accounted for no less than 37,338 in 1931, having increased from 27,620 in 1891.

Bhuksas

The Bhuksas are much akin to Tharus, with whom they are found mixed in the Tarai and the Bhabar zone from the Pilibhit district on the east to Chandpur on the Ganges on the west. Crooke has divided them into three main sections, the 'Purabi' residing in the east of Ramganga, the 'Pachahami' occupying the Patli Dun and Bijnor between Ramganga and the Ganges, and a section reaching still further west from the Ganges to the Jumna.

The origin of the word Bhuksa is not known and as to the origin of the tribe only this much can be said that they belong to the Aryo-Dravidian type. In *Ain-i-Akbari* they are mentioned as occupying the Tarai areas.

Dr. Stewart in *The Journal of Asiatic Society of Bengal*, Vol. XXXIV, describes them in Bijnor: "The members of the tribe are of short stature and very sparse in habits . . . . . Their eyes are small, the opening of the eye-lid being narrow, linear and horizontal; the face is very broad across the cheek bones, and the nose is depressed, thus increasing the general flatness of the face."

Sir H. M. Elliot describes them as having fifteen septs ('Gotras') of which twelve are superior and three of inferior rank.

Bhuksas are exogamous and cannot marry in their own sect. Marriage consists of three different parts, the 'Magni,' the 'ganana' and the wedding. In 'magni' the parents of the girl take the lead and send a rupee, one piece of 'haldi', a twig of 'dub' grass, and a piece of charcoal to the boy's house through a Brahman and a Nai. The 'ganana' is for the Brahman to bargain with both the parties for the selection of an auspicious day to which they have got to agree. The wedding is preceded by four feasts in both the families and followed by a fifth at the house of the bridegroom.

Widow re-marriage—'kaj' or 'karao'—is permitted, and divorced women may also marry. They may marry as many wives as they like but two is the usual limit. Boys are generally married at the age of twelve. If the marriage be subsequently annulled and the girl marries again, her second husband has to refund the expenses of the first marriage.

Bhuksas usually cremate their dead, but those dying of burning, drowning, snake-bite or some contagious disease are buried. "Before cremation two balls of kneaded flour covered with turmeric are placed on the chests of the deceased. The body is wrapped in a white, unwashed cloth, and as in the case of Tharus, is usually burnt (or buried) to the west or south of the village, though they can give no reason for this." The Mahra-Bhuksas found inhabiting the most unhealthy parts in eastern Dun are very particular in cremating on the bank of Ganges or at least depositing the ashes in the sacred river. For thirteen days after the death they give a cake to the cow before themselves taking anything and on that day they are purified by giving 'dan' to the Brahmans.

They worship several 'debis' and 'deotas', but the greatest of all is supposed to be at Kashipur. Crooke mentions that some are Sikhs, but probably they have again passed into paganism or have become true 'akalis' as the last census report does not mention their presence. They pay special devotion to Bhavani —the goddess of death.

As in all other branches of religion, customs, social status, etc., the houses of the Bhuksas are very similar to those of Tharus in structure and are kept equally clean.

Of their villages in Bijnor, Dr. Stewart says: "All are built on the same plan of one straight street, generally of con-

siderable width. The huts are placed end to end . . . . the walls are, for the most part, built of wattle and dab, but sometimes of thatch . . . . The houses are windowless but each has a door and another behind," where the cattle sheds are situated. The doorways and roofs are very low while the floor is raised higher.

At the census of 1891 they returned themselves as Panwar Rajputs but changed their caste name wholly in forty years, becoming Brahmanic Hindus at the census of 1931. It may be this change or some other factor which caused a great error at the census of 1891 when only 1,907 were recorded in the Province, as against 5,664 in 1881 and 7,618 in 1931. They have thus recorded an increase of 34·5% in fifty years. Mr. Colvin was obviously mistaken when he remarked that " they are slowly but certainly dying out," since they have increased from census to census.

Bhuksas are very backward in education, more so than the Tharus. In 1931 only 23 males were returned as literates and no females.

Bhars

The Bhar tribe has neither been so much Hinduised as the Koiris or Chamars nor has it remained in a wholly primitive state like the two mentioned above and so they do not deserve a detailed description.

They are distributed all over the Province with great concentration in the east, right from Mirzapur in the south to Gorakhpur in the north and Fyzabad in the west.

Bhars have the usual rules of exogamy. Widow re-marriage is permitted. A girl above ten years of age is known as 'rajaswali', and it is a disgrace not to have her married.

In physical traits it is difficult to distinguish them from the low caste Hindus with whom they have freely mixed.

The dead except those who are unmarried, or those dying of cholera and small-pox, are cremated. The others are buried or their corpse thrown into running water. The dead pollution lasts for ten days, during which time the chief mourner lays out a little food for the ghost.

Their tribal deities are Agwan Deva, Phulmati, Bhawani, the Panchopir and Banru Bir, a deified ghost.

The women are tatooed on the arm. The Bhars will not touch a Dhobi, Hela, Dom, or Dharkar, nor the wife of the senior brother-in-law, nor the younger's wife.

They are usually employed as day labourers and plough-men. They keep bees, pigs, goats and cows. They are keen sportsmen, untiring in pursuit, and excellent shots with guns, while the hatchet is their constant companion. Everywhere they have settled down in villages, acquired land and form very good agriculturists.

In the Tarai districts of the Province they numbered as many as 107,794 in 1891, while in the Province they totalled 417,745 at that time.

This great race had once ruled the districts in which they are at present principally found, and have left several mud forts as remnants.

Having so far dealt with the people who passed into the Tarai Region from the plain area to the south, we will now pass on to the people who have migrated from the hilly regions and are occupying the northern part of Bengal. They have, for centuries, lived under altogether different environmental conditions, and we must review the geographical factors which have not only influenced but built their culture.

" Every mountain slope " as Semple has said, " from summit to piedmont is, from the anthropological standpoint, a complex phenomenon. When high enough, it may show a graded series of contrasted complementary location, closely inter-dependent grouping of populations and employments, every degree of density from congestion to vacancy, every range of cultural development from industrialism to nomadism."

They have got to adopt terrace agriculture in the narrow valleys to support the growing population, and this needs special care, special implements and special treatment, with heavy fertilizers especially as the rainfall is very great and liable to wash away the thin soil.

Paucity of arable land in mountain regions leads to the utilization of the untillable slopes for stock grazing, and sheep are always maintained to supply manure, wool and skins as well as to add to the food supply and serve as beasts of burden when they migrate.

"To have and to hold" is the motto of all the hill tribes. The mountains are often museums of social antiquities, and these characteristics are amply illustrated by the tribes dealt below.

Lepchas

The Lepcha is of truly Mongolian origin and has only lately come into British India. They are found in western Butan, eastern Nepal, Sikkim, Darjeeling and Jalpaiguri.

"They are of short stature averaging about five feet. The face is broad and flat, nose depressed, eye oblique, no beard, but a little moustache, complexion olive." It is often difficult to recognise the males with no beard, long plaited hair and with clothes very similar to those of the females. "They are proud of their hair and careful in its arrangement, the women wearing theirs in two tails tied with silken cords." They are well clad with clothes, as might be expected. The cloth is often coarse and flossy silk woven from the 'eri' of Assam. Over this they have a sleeveless woollen overall, fastened by a girdle of silver chains.

They do not marry young. Huge sums are demanded by the parents of the girl. Sometimes marriages take place on credit when the boy goes over to reside with his father-in-law till he has paid the amount settled, and only then he is allowed to take the wife away.

They either bury or cremate their dead, according as the dead is a Buddhist, a Christian or a Hindu.

Dr. Campbell says, "They are amiable and cheerful in disposition and of an intelligent and inquiring turn of mind which renders them attractive to European." Col. Walter Sherwill calls them, "the free, happy, laughing, and playful, no-caste Lepchas, the children of mountains, modest, social, and joyous in disposition." They are fond of racing, playing at hop-step and jump, wrestling and jumping. They are great practical jokers, but are usually dull and lazy at work.

From the point of view of religion the Lepchas can be divided into four different groups, Hindus, Buddhists, Christians and Animists. Their priests wear Buddhist garment, follow the Buddhist prayer machine, and like them profess monkish medicinery, are exorcists and the directors of feasts, ceremonies and sacrifices in honour of evil spirits. For centuries they have been

so much under the influence of that religion that, as Dr. Latham states "whilst flirting with the mysteries of that religion they retain much of their original paganism or Sahmanism."

The Buddhist Lepchas have priests, some of their own tribe educated at home, a few of the same race who go for their education to the great monastic establishments beyond the snow, and some Tibetan priests.

They are poor agriculturists. Nomadic in their habits, they form no permanent village, and cultivate barley sufficient for their subsistence. They collect wild fruits, roots, ferntops and fungi and are very good hunters. Very like all the hill tribes they have no ploughs and with their rude implements are able only to scrape the ground upto a few inches in depth. This is probably more beneficial than harmful in their environments and climate.

They keep small herds of cows, goats and sheep, which graze under the supervision of the children. They are fond of milk and the females weave a very coarse cloth from the sheep's wool, or they exchange it for other requirements. When abandoning a village site their cows and bulls serve them as beasts of burden.

The Lepchas are not a warlike race. They carry weapons such as a long knife and bow and arrows, but are fonder of using them against wild beasts than against men.

They are not very prohibitive in the selection of their food stuff. Pork is their favourite dish, and beef, goat and mutton are all taken. Some of the Hindu Lepchas avoid beef. They are fond of fermented and spirituous liquors, but are not much given to excess. They make themselves a beer from a fermented infusion of Indian corn and 'murwa', which is very refreshing.

15,479 Lepchas were enumerated at the census of 1891; they increased at the census of 1901, but at the two following censuses they recorded a heavy decrease, which had been more than compensated at the time of the last census when some 25,161 were registered, of which 23,038 were Buddhists, 1,949 Christians, and the rest Hindus or animists. It is rather difficult to account for the increase of over 34% during the last decade except by migration to the tea gardens. They have lately come into disfavour at these gardens and are retiring to their home across the border.

It is very interesting to note, but rather difficult to explain, the almost complete absence of females amongst the Hindu Lepchas, who have returned only 8 women in a total of 214. On the other hand amongst the Christians, there is a fair majority of the fair sex. Females are again more numerous amongst the Buddhists Lepchas of Bengal.

Limbus

The Limbus are a branch of the people called 'Kirantis' or 'Kirati.' They are probably of Mongolian descent, and have been mentioned in the *Vishnu Purana.*

The Limbus, according to Dr. Campbell, "form a portion of the inhabitants in the mountainous country lying between the Dud-Kosi and the Kanki rivers in Nepal. They exist within the Sikkim territory, as far as the Tista river, beyond which they rarely settle."

Dr. Campbell (J.A.S., 1840) compares them with Lepchas in the following words: "The Limbu is a little taller in stature than the Lepcha, somewhat less fleshy, and more wiry in limbs, as fair in complexion, and as completely beardless. He is scarcely as ruddy as the Lepchas sometimes are; his eyes, if anything, smaller, and placed more to the front than the Lepcha's and his nose, although somewhat smaller, is rather higher in the bridge than that of the Lepchas. He wears his hair long, but does not plait it into a tail; has no fancy for bead necklaces; wears a 'Kukri' instead of the 'ban'; and wide trousers and a jacket or 'chapkan' in preference to the robe and long jacket of Lepchas."

They may call themselves Hindus, Buddhists or Christians but they are essentially pagans. Mr. Hodgson found that they had no name for God, and no recognised order of priests. They worship a host of spiritual beings whose attributes even are not very well defined. They do not build temples, or make images of these gods, but propitiate them by the sacrifice of buffaloes, pigs or fowls, only when need occurs. On these occasions the persons employed as priests are either Bijowas or Phedangkos. Bijowas are a very interesting class of mendicant friars, "who by cunning and charlatanism inspire their votaries with considerable awe, but who are ready for a consideration to sing or dance for those in health, prescribe for those who are sick, and cast the evil out of those who are vexed." The Phedangko is more exclusively

the Limbu priest. He officiates at sacrifices, marriages and funerals. After the birth he foretells the destiny of the infant, and invokes the blessings of the gods, by sacrificing a fowl or a kid.

The Limbus purchase their wives by money or labour. The men select for themselves and then send a present of a couple of rupees through friends who negotiate for the price or other preliminaries. On the day fixed for the ceremony, the bride and the bridegroom are seated side by side and the priest admonishes them. "He then gives a hen into the hand of the bride and a cock into the hand of the bridegroom and cuts off the cock's head first and then the hen's; their blood is allowed to mingle and auguries as to the prospects of the happy pair drawn from the form it assumes as it flows."

Both cremation and burial are in vogue amongst the Limbus, the latter being the more common. Cremation is carried out on the summit of a mountain and the ashes are collected and buried in a grave, over which they raise a square tomb of stone, about 4 feet high, placing an upright stone on its summit. On this stone they engrave a record of the quality of largess distributed at the funeral of the deceased, in Devanagri or Lepcha character. In the case of burial the corpse is placed lying on its back with the head to the east. "The grave is lined with stones, and a cairn, consisting of four tiers for a man and three for a woman, erected on the top. The Phedangko attends at the funeral and delivers a brief address to the departed soul on the general lot of mankind and the doom of birth and death, concluding with the command to go whither his fathers have gone and not to come back to trouble the living with dreams." A rupee in a brass plate is occasionally placed under the head in the grave. Mourning is expressed for a month by a white rag tied round the head.

They possess plough but do not use them in the small terraced fields. Hodgson remarks, "Their general, almost exclusive status is however agriculturist, they produce maize, buckwheat, millet, dry rice and occasionally cotton. They have no craftsmen." The Kirantis, however, spin, weave, and dye clothes for their own use, and make fermented and distilled liquors.

"In the matter of food they have very few prejudices. They eat beef, pork and the flesh of all the clean feeding animals, and drink wine." They keep fowls, pigeons, herds of cows and buffaloes.

Only at the census of 1921 they showed a decrease, which might have been due, at least in part, to the great influenza epidemic of 1918. In spite of this they have increased from 17,386 in 1891 to 27,889 in 1931. Of these 17,860 were returned as Hindus and 9,969 as animists. The decrease of the Hindus by 4,783 at the last census and the increase of the animists, much at their cost, illustrates fully the statement of Col. Dalton who describes their religion as follows. "The Limbus or Kirantis, though subjected to the sneers and frown of a Brahmanical priesthood on one side and the more indulgent exhortations of Buddhist monks on the other, have, like the Kols, obstinately adhered to their primitive paganism." It cannot be said how far the queer system of the voluntary conversion of Murmis, Lepchas, and Butias by the approval of the council and on a declaration at a feast, has been responsible for this great increase. Khambus, Jimdars and Yakhas, being Kirantis themselves, are allowed to enter the folds of the tribe, without the permission of the council.

Mechs and Khambus

All the authorities agree in considering Mech, Khambus and Kachari as the same people, or at least of common origin. The name is almost certainly a corruption of the Sanskrit word 'Mleccha.'

The Mech are to be found in the Bhutan duars. From thence they extend in a westerly direction up to the Kanki river in Nepal Tarai. They are fairer than their neighbours, the Kocchs, and have more markedly the Mongolian characteristics, "but accompanied by softness of outline which distinguishes them readily from the more marked features of the same order, as exhibited in the Lepchas, Limbus, and Butias They are said also to resemble the Mugs and Burmese."

They are definitely animistic in religion, based characteristically on dread and fear. They worship their ancestors, natural forces and about nineteen gods of household and village importance. They have no priests and all religious offices are discharged by 'Deoris', who are usually men of a certain age and recognised. They worship the 'Siju' tree as the emblem of supreme deity.

Marriage by capture was largely, if not universally in vogue among the Mechs in earlier days, but now a contract is entered into. As among the Lepchas and the Limbus the bride price

is to be paid either in cash or in labour by the bridegroom, but the girl does not leave her home till she has attained a suitable age. On the marriage day the bridegroom generally does not accompany the marriage party to the house of the bride, where her people pour freely on the whole party an irritating liquid known as 'Kachu pani' and to this somewhat rough welcome the bridegroom's party are bound to submit without complaining, although the liquid causes much irritation to, and even blisters, the skin. The party then hands over the presents and is then served with meals by the bride herself. All expenses attending the marriage are borne by the family of the bridegroom, the bride's people, as a rule, contributing nothing. Drinking, merrymaking and dances are a feature of these marriages.

The dead are disposed of either by burial or by cremation. The latter is looked upon as more correct and respectable, though the former is more common for reasons of economy. In the case of well-to-do people a certain number of rupees are usually buried with the corpse, and even the poorer classes make offerings of pice, etc. In the case of cremation after placing the body on the funeral pile, the deceased's friends and relatives pass round it in procession. The ashes are not carried away.

Agriculture is the great industry of the Mechs and the Kacharis, both the hot weather and the cold season varieties of rice being largely cultivated. In carrying out this work the people show both application and skill. They are specially skilful in the construction of irrigation canals and earthwork embankments; and their efforts in this direction are very largely aided by their clannish organisation. Pulses, tobacco and occasionally a little sugarcane are also grown. They weave fabrics of 'muga' and 'endi' silk.

With the exception of beef the Mech denies himself almost nothing. His great delicacy is pork, and a Kachari village usually swarms with pigs. "There is, however"; as stated by Rev. S. Endle, "one common article of food, which no orthodox old-fashioned Kachari (or Mech) will ever touch, *i.e.*, milk."

Mechs have been recorded almost exclusively in the Jalpaiguri districts, where they total 9,503, having decreased very gradually from a total of 22,350 in 1901. Of these 9,503 only 2,528 were classed as animists and as many Christians. The advance of settled cultivation is driving these shy people from Bengal into the less developed parts across the border in Assam.

Bhutias

The Bhutias represent a complicated mixture of tribes from Bhutan, Nepal, Sikkim and Tibet.

Their history is shrouded in mystery, but between 300 and 400 years ago they had several conflicts with Kocchs whom they forced to submit.

"Physically the Bhutias are a very fine people, there are some really tall men amongst them, but though very robust as compared with the people of the plains, they are not nearly such a stalwart race as Sikkimese, and Tibetans, which is possibly to be attributed to their immorality and drunkenness." . . . "They have all broad flat faces of the true Mongolian type, small oblique eyes, large mouths, noses short and low, not, on the whole, the most attractive combination of features; but many of the young women have fine plump rosy cheeks, healthy and pleasant to look upon, though their complexion, a light olive, has nothing in common with the lily. They appear rather careless about their personal appearance. Many women appear with shorn heads. There are nuns who are said to have taken vows of celibacy. As a rule they are dirty in their persons, wearing their clothes till they rot off, and seldom indulge in ablutions."

They wear a lose woollen coat reaching to the knees, bound round the waist by a thick fold of cotton cloth. The full front of the coat forms a huge pocket, and "into this opossom-like pouch, food cooked and uncooked is often thrust, including fish and meat, and as one side of it is the naked skin of the owner, the nastiness of the arrangement may be conceived." The women wear a long cloak with loose sleeves.

The predominance of the Buddhists is so great among them that the negligible proportion of the Hindus, Christians and animists does not matter in the consideration of their religion. The Ghylongs, Lamas or priests form a very lorge proportion of the population. The office is often not hereditary and any one can be admitted to the priesthood on payment of a fee to the Deb, or the Rajah. The Lamas are also charged with the medical care of the people. They wear dresses of a garnet colour, a woollen garment thrown over the left shoulder leaving the right arm bare. They live in big monasteries and preach that the soul of the religion is mental abstraction. They may call themselves Buddhists but they are still pagans in the true sense of the word, believing

in a host of spirits and making offerings of flowers, rags, rice and pulses before them.

Marriages are not very binding and chastity is neither practised nor appraised. Polyandry is a recognised institution amongst them, and the practice increases as we go to the north. Its origin is clearly traceable to Tibet, and Pemberton adds that, "Political ambition is the main cause of so revolting a practice, as all aspirants for office are compelled to renounce the happiness of domestic life." There is no law of inheritance, as the dead man's property goes to the Deb or Dharma.

In the disposal of their dead the Bhutias follow the practice of Hindus. They cremate the dead and throw the ashes into the nearest stream.

In the construction of houses the Bhutias are rather in advance of their neighbours of the plains. Their buildings are of rubble stone and clay and occasionally go up to four stories. The varandahs are neatly ornamented with carved and painted wood. Mr. A. Eden reports that they display considerable architectural and constructive skill in building embankments and bridges.

It is only the coarser description of cloths worn by the Bhutias that are woven in the country; their silken dresses and finer woollen fabrics are obtained from outside. The work of weaving falls to the lot of women. They have acquired the art of paper-making from the bark of 'diah' tree and have their history written. They have learnt the art of distillation and prepare their drinks from wheat, rice and millet. Many of them are engaged as carpenters and wood-carvers in several big towns of Bengal. They also keep goats, sheep and cows. Terraced agriculture is followed on the hilly sides.

They are very fond of horse racing. The function is rather an exhibition of the skill and dexterity of the rider, and no attempt is made to test the speed of the horse. The riders are practically naked, but the horses, though without saddle, are well decorated.

Their number in the British Territory is fluctuating from census to census. At the time of enumeration, it seems that a little mistake transfers a considerable number from one column to another, as their homelands are also recorded. In 1931 they totalled 29,454 having increased from 27,287 in 1921 and 17,676 in 1891. The Bhutias of Sikkim and Nepal contribute the main propor-

tion of the total number of Bhutias recorded, though in British India they hail mainly from Nepal.

Koch or Kocch

The Kocchs as the Bhars described above, are the remnants of a great race. They have like the Bhars, become comparatively civilized and so only deserve a passing reference. The Cooch Behar State is the nucleus of their once great kingdom. They are distributed throughout the Province and many of them have entered the folds of Islam.

Their women really form the better half. When a woman dies, the family property is divided amongst her daughters; and when a man marries, he goes over to live with his wife's mother. Marriages are settled by the mothers when the parties are young, but the girl may change her mind and select her own husband when she grows.

"The dead are kept two days, during which time the family laments, and the kindred and neighbours assemble, eat, drink, dance, sing and make merry; the body is then carried to the side of the river and buried.

Rishi is their supreme deity. At the end of the rainy season a grand sacrifice is made to the deities by the whole tribe. They also sacrifice to the sun, moon, stars, and to the gods of woods and rivers. When they collect the first crop, they offer some of the first fruits to their ancestors.

Living in the plains for a long time they have become very good farmers and cultivate rice, jute and tobacco.

In the Tarai districts the Hindu Kocchs total 15,047 out of a total of 81,299 in the Province. Cooch Behar accounts for 1,230 only.

With these tribes ends the list of communities which have been selected as representative of the different elements of which the vast and complicated society of these varied people is composed. What all this brings home is that a tribesman of the Tarai Region is "essentially conservative. There is little in his environment to stimulate him to change, and little reaches him from outside world." He is strangely indifferent to what his fellow beings are doing a few yards away from him. With his conservatism is "coupled suspicion towards strangers, extreme sensitiveness to criticism, superstition, strong religious feeling, and an intense love for home and family." While these forces are acting against him, there is little hope of his rapid progress.

Extracts from Periodicals

CLASSWORK AND HOMEWORK IN GEOGRAPHY

By

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There is probably no subject which offers a greater variety of opportunities for pupil activity than Geography. Thus there is no excuse for the teacher who allows his classes to fall into a monotonous routine of copying maps and learning notes as their share of the business of learning geography. Pupil activity is a term which obviously includes the work done by pupils during the course of the lesson, or before it, or after it. In other words it includes class work and home work, group work and individual work. Before describing a few of the almost unlimited possibilities for pupils to work in the geography class or at home, it may be worth while to examine the aims and values of setting work for our pupils.

It is an established fact that we all, teachers and pupils, parents and children "learn by doing" or in other words that learning is an active process. Teachers cannot teach; they can only help their pupils to learn. Consequently the work which our pupils do is far more important in their education than anything we teachers can do for them. And work which they do with interest and enthusiasm is far more valuable and lasting than work done because it must be done.

In teaching geography we are trying to help children learn certain important geographical facts and relationships. These may be explained, or pointed out on a map, deduced or discovered, by the teacher and pupils working together in various ways using various kinds of equipment. Often pupil activity either in the class or at home may be in preparation for this co-operative endeavour in the class-room. The term 'Prep' so commonly used in England emphasizes this aspect of home work. The preparatory type of home work may be purely mechanical including such things as preparing a series of sketch maps to be filled up in class; or it may be a truly creative piece of work, a problem solved, a discovery made, a principle grasped for the first time,

On the other hand, the pupil's work often may be a continuation of the work done by teacher and pupil together in the class period; for example the completion of a map began under the teacher's guidance and finished alone, the necessary revision of notes, the reading of a supplementary book. Again pupil activity may be in the form of practice or repetition of the facts and relationships presented and comprehended in the class period. The necessity for drill, the repetition necessary to fix and retain material learned is obvious. There is therefore a legitimate place for drill in geography teaching and there are so many ways of drilling that the drudgery sometimes implied in the term may be minimised by the interest and variety of the methods employed. Again in teaching geography we are trying to help our pupils learn to use the 'tools' of the subject, maps, graphs, diagrams, instruments, and to learn to use them easily and independently. Therefore there must be time for pupils to work with these tools. They should learn to make and read maps, graphs and diagrams quickly and accurately.

The pupils' work whether in the Geography period or at home, should not be thought of as something separate and different from the teaching. One supplements and completes the other. Both are parts of the integral whole which is learning geography. There should never be the feeling that one kind of work is suitable for home work, another for class work and a third for the teacher; that this piece of learning is always to be undertaken by the pupil and that is always to be presented by the teacher. The whole process is (or should be) related; one part leading up to and preparing for the next, all equally valuable and as necessary to each other as the links of a chain. Let us never think of homework as 'busy work,' just something to keep the children occupied in their study hours. Let us never think of class activity as merely a pleasant change from listening to the teacher, necessary as recess is necessary. No, the teaching-learning process is a cycle. Home work leads us to and prepares for the class period. The class period may include both teacher's work and pupil activity and should culminate in the assignment of the next piece of homework.

Any discussion of the kinds of pupil activity must necessarily be incomplete. But perhaps a brief description of certain types of work may be suggestive to the enterprising teacher.

Map work is probably the commonest form of geography homework and class-work, and rightly so. It may often be done to help children acquire facility in the use of this tool, both as a

means of expression of geographical facts and as a source of geographical information. The chief aim in this type of map work is to make children familiar with the symbols used on maps and to enable them to understand the reality behind the symbols. Therefore it is often a good plan to let children invent their own symbols, pictorial or colours, or shading. Encourage the pupils to make maps which are different from the rest of the maps in the class which show the same things. Of course care must be taken to keep the commonest conventions but there is scope for much inventiveness in the use of symbols. If a map the teacher has drawn is to be copied, suggest that it should be expressed by different symbols. Making new maps, using either verbal information or statistics is an extremely valuable exercise. Suppose the text book says "sheep are found in large numbers in the Canterbury plain," the pupils can be asked to locate the plain on their outline maps, and to write the word SHEEP in several places. This of course results in a rough and approximate map. At a later stage the use of figures and their conversion into dots or shades of colour on the map may be taught and more exact results obtained.

Using map work for drill is another popular exercise and again rightly so. But the exact copying of any map should generally be avoided. If the textbook and atlas do not contain a map with certain necessary facts, the teacher is then justified in asking his pupils to copy a really valuable map. But in most cases the pupils should be directed to select certain facts from the maps they have, and put them on a new map. The selection of a few rivers with only their main tributaries is far more valuable than drawing all the rivers shown in the atlas. An economic map may be separated into several maps. For instance a map may show the distribution of the minerals of India. Let the pupils make a number of small maps, each showing one mineral. This process of selection fastens the attention of the pupils on the important facts which must be learnt, and the simplicity and clearness of the resulting maps serve to emphasize the facts which must be remembered.

Another interesting map exercise is the reverse of the one just described. Two maps from the atlas or text book may be combined and a new map produced. Often valuable relationships may be discovered by doing this. One method is to have a map showing, let us say the distribution of rice in India drawn on transparent paper. This may be superimposed on the rainfall map, the relief map and the population map. Then when the

pupils have seen the relationship between the 40 in. rainfall line and the distribution of rice, a map showing both should be drawn. Other maps which may be usefully combined are summer and winter temperature maps, summer and winter rainfall maps, and almost any crop distribution with its climatic or relief controls. Population maps are full of possibilities for this sort of map-correlation.

From what has been said it is apparent that the filling up of the map is of greater importance than the drawing of the outline. Teachers should make every effort to supply their pupils with outline maps. The exception to this of course is in the use of sketch maps. On a sketch map, the pupil or teacher is expressing in a generalised and approximate form a few salient points to be remembered. The use of the sketch map as a form of geographical shorthand and as a means of summarising a lesson should be encouraged in every possible way. Let us emphasize especially the fact that skill in drawing is not essential for the making of a sketch map. A glance at any of the sketch map geographies or atlases now available should reassure diffident pupils on this point.

The use of diagrams, climatic and economic is an important part of geography teaching. Rainfall and temperature figures may be used, graphs made and studied. The climate graphs found in textbooks should be interpreted. The same principles applies to the making and interpreting of economic diagrams. The best modern textbooks all give statistics which can be converted into diagrams. The easiest form of diagram is the horizontal bar, but very nearly as easy to make is the pillar of vertical column diagram. The circular diagrams is more difficult but with a little help from the mathematics teacher and some reference to the standard of mathematical achievement of the class, the circular diagram may provide a very interesting exercise.

Simpler than converting figures into diagram is to change the form of the diagrams. A bar may be changed into column or vice-versa. A circular diagram may be changed into either the bar or the columns. All diagrams should be read. It is quite useful to "translate" a diagram into a paragraph. For instance a diagram showing the exports and imports of a country would furnish material for an interesting paragraph on the trade of that country.

The guided use of the text book is another excellent activity for our pupils. A series of questions may be prepared so that the

answers when written in sequence provide a concise summary of the chapter. Or a summary may be prepared with important words omitted. The pupils on reading the book will fill up the blanks. This sort of exercise should help pupils to read their textbooks intelligently instead of memorising them word for word. Encourage the pupils to make summaries or outlines of what they read. Give tabulated headings which may be filled up after the reading of the book.

Another interesting exercise involving the use of textbook is to ask the pupils to frame questions on the chapter to be read, which they may ask their class-mates. A correct answer to a neighbour's question (judged by the questioner rather than the teacher who will only intervene if the questioner is wrong) means an opportunity to ask a question of another neighbour. It is not possible to get a connected series of questions in this way but in spite of that it is a good exercise and stimulates careful reading and remembering of what has been read. Actually a small group of intelligent pupils will be able to frame a connected series of questions on the text-book or on the atlas. Once in a while let four or five of best pupils "teach" the rest of the class! The result will be surprisingly good.

As a change from the rather precise type of exercises already described, it may be useful and interesting to suggest an imaginative essay based on geographical knowledge. It is perhaps most useful as an incentive to revision after the study of a continent. "A journey on the Trans-Siberian Raiway". or "Along the coast of Africa," or "Up the Nile" or equally interesting are "life stories," "My life" by a tin of apricot jam, "My Career" by a red woollen blanket. Further types of essays are imaginary conversations, with a cowboy of the Prairies, with a guacha of the Pampas, with a miner in Australia.

One type of pupil activity which can only be mentioned in passing is the making of models, generally showing relief of rivers. This is a topic which needs more detailed explanation than can be given in this article. But it is a valuable form of work, and it may be done with less effort and in less time if damp sand (not mud) is used as the modelling material instead of paper pulp or clay. Finally the possibilities of using pictures as a basis for pupil's work should not be overlooked. Questions about the pictures, verbal descriptions of a picture and various other activities may be planned.

—*South Indian Teacher*, Aug. 1941.

MAP STUDY OF CURRENT NEWS

How They Do It in an English School

One serious problem to-day is the interpretation of current events for our pupils. Children, even the younger ones, see the newspapers, listen to the wireless and overhear much conversation that is confusing and often alarming. The school must make an even greater effort than usual to clarify the news and give much-needed guidance on world affairs, writes a correspondent in the *Times Educational Supplement.*

The majority of schools work, in some form or another, through regional geography schemes. Such schemes can be modified so as to include current events and to give a helpful background for the explanation of day-to-day happenings all over the world. In addition to the valuable guidance for the pupils this will be found to have a good effect on the general "reality" of the lessons.

An ideal scheme involves the close co-operation of the history and geography specialists, so that the geographical factors and the historical interpretation are both given full value. One school has made use of such a scheme for the past few years with excellent results.

Throughout the school a certain amount of time was definitely allotted in each geography lesson for comment on current events. It was found most convenient to use 10 or 15 minutes, or a shorter period, according to age or the amount of "front-page news" available, at the beginning of each lesson. If at all possible, the event commented on was of particular value to the class in view of the part of the regional scheme reached. For example, if the class were at a point where they were paying particular attention to the Arctic or sub-Arctic region, and there happened to be some news of those parts, then that was the news most concentrated on. This does not mean that the pupils were lead to suppose that such a piece of news was more important than any other, but they were told how it held particular interest for them by reason of the work they had already started.

In addition to this brief commentary each class had a special "news lesson" every week. A similar one was given by the history specialist, after the geography one, as it was found more helpful in that order. Such lessons were illustrated by means of the large globe, very large regional maps, and the pupils used individual atlases for further detail. Illustrations from magazines and newspapers were pinned up and passed round. Every effort

was made to help the children to visualise the actual territory, to "see through the map" and to realise the significance of geographical factors on the daily life of the world.

In a large lobby, through which all pupils passed several times a day, and where they assembled for "elevenses", we had two big notice boards, one of which held a large regional map of the world, the other news cuttings. Pupils with a suitable member of the staff to give help if needed, were in charge of these, taking it in turn to read the newspapers each day and pin up important cuttings, with occasional comments pinned below to clarify matters. The map was equipped with various pin-on flags and signals, cutouts for ships, made by the pupils in their individual work periods, and notices for such physical phenomena as volcanic activity, earthquakes, tidal waves, hurricanes, extreme frost, and so on.

It was the business of the pupils in charge of the map to see that the various pin-on flags were moved correctly each day before 11 o'clock. As the school time-table allowed for a good deal of individual study during the first few hours, there was plenty of time to get information from the pupils in charge of the newspapers. When any news of exceptional importance occurred a special large red flag was pinned on the spot on the map, while a brief comment was written and pinned in the margin of the notice board.

In addition to world news, which does, of course, need most emphasis and comment, the children were always encouraged to notice and comment on more local events that had a geographical basis. For instance, a severe frost would have important effects on the local fruit growing industry, or a gale, noticed by its fury in the school vegetable garden, would probably cause the local lifeboat to be active. Local papers were studied once a week and cuttings put up on a special section of the board, with comments by any pupils who had made special observations at the actual time of the occurrences.

Too few adults have any conception of exactly where events are happening, and though the various maps, published from time to time in the papers, are of some help they are always too limited an area to give real clues to the importance of neighbouring States or to indicate what repercussions any event may have. Soundly taught regional geography, it has been shown by this scheme, can give the guidance needed for understanding current events.

Times Educational Supplement,

News and Notes

The Presidential Address of Mr. M. Subramania Iyer, B.A., B.L., at the 11th Geographical Conference held at the Rishi Valley in May last, has for theme a reasoned Defence of Modern Geography and a Comprehensive Introduction to it; and gives also a brief account of the steps taken to establish it in Madras. The Address is published in this issue as the main article. Some of the remaining papers of that Conference will be included in the next issue.

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In the July meeting of the Association, held on 19—7—'41, Mr. N. Subrahmanyam explained the plan and principles of the new elementary school syllabus in Geography, recently issued by the Madras Educational Department—the first modern one, which has taken a dozen years to filter down from the high school. A vigorous discussion followed, regarding the possibility and ease of covering the syllabus within the time.

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A Refresher Course to explain and elucidate the methods of handling the subject at the stage and according to the syllabus, and Children's Books prepared in the mother-tongue in accordance with it are two immediate needs. And in preparing books in the mother-tongue, two difficulties have to be got over—the first is that of finding proper equivalents for the technical terms, and the second is the correct pronunciation and therefore the correct spelling of place-names.

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In the August meeting of the Association, held on 9—8—'41, Mr. S. Muthukrishna Iyer gave a talk to teachers on *Assignments in Geography for Forms I to III.* Speaking on the kinds of practical work that should be done in those classes, he put special emphasis on local observations of the sun's altitude, weather, etc., and explained in detail the methods of recording and utilising the records.

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The Indo-Brahm River.—Messrs. M. S. Krishnan and N. K. N. Aiyengar have, in the *Records* of the Geological Survey of India, Vol. 75, July 1940, discussed the problem whether the Indo-Brahm or Siwalik River ever existed. On the southern side of

the Himalaya, in the Indo-Gangetic plains, there is a thick series of Middle and Upper Tertiary deposits, known as the Murree Series (Lower to Middle Miocene) and the Siwalik (Upper Miocene to Lower Pleistocene).

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* * * Pilgrim and Pascoe argued that the Siwaliks were laid down by one great river flowing from Assam to the Punjab, and thence to the Arabian Sea, and that this river was later dismembered by a process of capture. The present authors question this view, and suggest that it is unreasonable to suppose that the great masses of the Siwalik deposits were laid down by any such river. They argue that it is much more probable that these beds were deposited in a fore-deep. * * * * The Boulder conglomerate which forms a fairly constant horizon at the top of the Siwaliks is regarded as being due to the combined action of streams draining from the mountains directly on to the plains, helped in part by recent geological uplifts and special flood conditions.—J.A.S. in GJ.

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Sometime ago we read of a vast field of gypsum, situated between Sulurpet and Pulicat Lake. Now, the Geological Survey of India mentions in a Bulletin on Economic Minerals about the existence of phosphates within a depth of 200 feet in Trichinopoly District, Madras and in the Singbhum District, Bihar. Phosphorus-bearing minerals are of particular importance to agriculture, since the element is an essential constituent of plant food. Phosphorus finds application in smoke-screens, incendiary shells, tracer bullets, grenades, fire-works, medicine and vermin-destroying pastes, while the acids and salts of phosphorous find extensive use in various industries. India is a fairly important importer of fertiliser materials, including super-phosphate and ammonium phosphate, though there is considerable scope for the expansion of the manufacture of phosphates. This is a matter which ought to receive the earnest consideration of the Government and industrialists alike.

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War and Geography.—The War has been expanding and widening in new areas and directions, helped and hindered by Geography. We referred in the last issue to the quickening of industrial activity in India as a result of the War; and though there has been the closing of certain markets, commerce with the U.S.A., has been considerably on the increase, as pointed out in *The Indian Information.*

* *

"These are the trump-cards in the hands of freedom—oil, copper, rubber," said Lord Halifax, British Ambassador to America, in a speech at the Minneapolis Rotary Club. . Lord Halifax listed these three as the most essential materials for winning the War and pointed out that the British Commonwealth of Nations dispose of some 70 per cent of the world's supply of oil, 85 per cent of the world's copper, still beyond Hitler's reach and no less than 91 per cent of crude rubber. "These are hard and simple facts which constitute a challenge to those doubting minds which cannot see certain assurance of the ultimate collapse and defeat of Hitler."

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The combined Annual and Spring Conference of the (British) Geographical Association was held at Edinburgh, for the most part at the University Department of Geography. Special attention was paid to current affairs through lectures by (a) Professor J. L. Myres on "The Position of Greece in the Eastern Mediterranean," (b) Professor P. M. Roxby on "The Changing Structure of Chinese Society," (c) Professor M. P. Fleure on "The Mediterranean and Islam." The second day of the Conference was devoted to a Study of Edinburgh, with lectures by Mr. F. C. Mears on "Edinburgh, Past and Future" and Professor A. Ogilvie on "The Physical Setting of Edinburgh." Visits to see the various aspects of the City and motor excursions to the Stirling District and Ochil Hills formed part of the programme of the Conference.

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The Oxford Colleges are making more provision for the award of Scholarships and Exhibitions in Geography. During the year 1941--42 Hertford College will again award a Scholarship of the maximum value of £80 for Geography. It has now been decided that University and Balliol Colleges, New College, Magdalen and Corpus Christi Colleges will include Geography as *one* of the subjects which may be offered for scholarships, Demyships and Exhibitions in Modern Subjects. Each candidate must offer *two* subjects of which Geography can now be *one*. It is thus possible for a Geography scholar to combine Geography *either* with the Humanities *or* with Science. The War has emphasised the value of Geography as a subject in Education and its importance is being increasingly realised in the University of Oxford. For example, there is now a separate Faculty of Anthropology and Geography.

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The Third General Assembly of the Pan-American Institute of Geography and History was held at Lima (Peru), March 30 to April 6, 1941. Delegates representing 20 of the American Republics were enrolled as participants; and of the foreign delegations, those from Mexico and the United States were the largest. After a gracious welcome at the Government Palace, the Assembly was declared officially opened by the President of the Peruvian Republic who was also the Honorary President of the Assembly.

At the preliminary session the following sections were announced:—

I. Topography, Cartography, Geodesy, Geomorphology and Geodynamics.
II. Human Geography and Ethnography; Biological Geography; Economic and Historical Geography.
III. Pre-History; Archaeology; Pre-Columbian History.
IV. History of the Discovery, Conquest, Colonization, and Emancipation; America in the Present Epoch.

Although Sections I and II were arranged primarily for Geography and Sections III and IV for History, joint meetings of various sections were held when subjects of common interest were to be discussed. In Sections I and II some 75 papers were presented by their authors or read in abstract; in History and Archaeology the number was somewhat greater. The papers will be published in the Proceedings of the Institute.

Reviews

The Golden Hind Geographies: Second Series—Book 3: : *The Gifts of the Earth.* By Leonard Brooks, M.A., & Robert Finch. 272 pp. University of London Press. 1940. Price 3sh. 6d.

This book is the third of a series, which provides an alternative course to that adopted in the authors' Columbus Senior Geographies, and is designed for use by pupils from 11 to 15 years of age. After furnishing the groundwork in the shape of the Homeland (Britain) and the rest of the World in the first two books, they treat about the economic aspect of human geography in this volume in a simple descriptive way under such catching titles as 'Getting a living,' 'Geography helps to decide,' 'Man plays his part', 'Sea harvests' etc. Instead of the formal and academic methods of treatment that are usually followed, they have presented to the pupils first hand accounts of the life and work of peoples in many parts of the world, teaching at the same time simple geographical ideas and principles. The volume is copiously illustrated with excellent pictures and maps, which serve to render the subject matter vivid and lifelike. The notes under the pictures and the suggestive exercises at the end of each chapter compel the attention of the pupils to points and aspects, which might otherwise be neglected. The World base maps of the Major Geographical Regions and of the Population on the two fly-leaves serve for reference as well as for revision. The bold print, the glazed paper and the fine get-up make the book attractive. Though on account of the Departmental Syllabus, the volume cannot be prescribed as a text-book, yet we strongly recommend it for library reading by every pupil.

Man The World Over—Book 3. By C. C. Carter M.A., and H. C. Brentnall, M.A. xvi, 264 pp. Basil Blackwood, Oxford. 1941. Price Rs. 2 As. 4.

This is another book that lifts Geography from the beaten track and presents the material of its human side in a fresh and interesting manner on the foundations laid by the first two books. Ignoring the cataclysms of the moment the authors have gone to the fundamentals of Human Geography and discussed the topics of Food, Industry and Commerce, Population of the World, and Colonisation, each in a separate part. The treatment is original,

stimulating and suggestive, presenting descriptively facts which are usually omitted in ordinary text-books, making a fresh approach to the material. The numerous pictures, maps, and diagrams with the notes accompanying each, carry on the arguments further; and their interpretation as well as the suggestive questions given under each chapter afford valuable exercise in fixing the facts and principles in the minds of the pupils. The requirements of the Departmental Syllabus here may prevent the book from being used as a text; but it is strongly recommended for library study by every pupil and no school library should be without it.

Twenty Essential Studies in Geography. By George Noyle. viii +184 pp. Macmillan & Co., London. Price Re. 1 as. 9.

This book provides a simple revision course in Geography, helping to crystallise and fix the fundamental facts and principles of the subject, discovered by the children in their studies of the World and the Homeland (Britain). In part I the World is surveyed in simple climatic regions. "The prevailing geographical conditions are utilised to build up the main points of natural life, culminating in the effects of modern influences." In part II, which treats of the Homeland, "the work is based upon the essential needs of the people and the manner in which they are fulfilled according to the circumstances of geography and the demands of civilisation."

The well-defined maps in part I, while establishing the position of each region in the world, provoke at the same time the habit of reference to the atlas for further information. A unique feature of the book is the picture summary given at the end of each chapter, accompanied by groups of stimulating and instructive exercises. Among the latter are included further summaries in simple, concise sentences for note-book and memory work; reference work with the glossary printed at the end of the book; written tests; and useful and interesting exercises on the maps. The book is recommended for pupils' library, especially for individual work.

Living and Earning a Living: Book I—South India and the Southern Continents. By Helen T. Scudder, M.A., Dip. Geog. ix+ 149 pp. Oxford University Press 1941. Price Re. 1.

This is a text-book of Geography, suitable for use in Form I of schools in Madras Presidency, being prepared in accordance

with the recently revised Departmental Syllabus. Owing to the general prevalence of the vernacular medium of instruction in non-language subjects in the middle school forms, the few schools in which Geography is taught through the English medium have hitherto laboured under the disadvantage of having no suitable text-book in English for the use of pupils. That gap has now been partly filled up by this book under review, which we hope will be followed soon by text-books for forms 2 and 3 also.

The author, who is a keen and experienced teacher of Geography, has presented the matter in a refreshingly interesting manner adopting a simple descriptive style. The things "to find out" at the opening of each chapter and the stimulating exercises at the end of each provide material for individual and group work, and ensure pupil activity. The numerous pictures, maps and diagrams as well as the statistical data serve not only to throw further light on the subject matter but also to supplement it in a vivid and pleasurable manner. The book is strongly recommended for use as text-book especially in such of the South Indian schools, where English is the medium of instruction. Even in other schools, it can be used for supplementary reading.

Descriptive Geography for class IV (Tamil). By N. Subrahmanyam, M.A., L.T., F.R.G.S., and K. Ramamurthi, M.A., L.T., Dip. Geog. 60 pp. P. Varadachary & Co., Madras. 1941. Price As. 7.

Modern Geography has been filtering down from above in the schools of Madras Presidency. Twelve years ago the upper forms were touched; six years ago the lower forms; and the elementary schools have just now been reached. The book under review is the first of a series brought out in order expressly to meet the requirements of modern geography as prescribed by the new syllabus, just issued by the Department of Education. The matter has been carefully chosen and presented in a clear simple attractive style and illustrated with expressive pictures and maps. The printing and get-up satisfy the requirements of children's books—bold type, clear print and good paper.

Chromite in Mysore. By V. T. Venugopal, B.A. Mysore Geological Department. 24 pp. 1941. Price As. 8.

This pamphlet, issued as No. 2 of the *Popular Studies* of the Mysore Geological Department, is really a popular presentation

of a technical subject so as to be easily intelligible to the lay reader. After describing the appearance, detection, and mode of occurrence of the mineral, the author first gives a general account of the producing, business aspect and marketing of the ore, and then a detailed account of its production in Mysore, rounding it off with a brief statement of its metallurgical and chemical uses in peace and war as well as the statistics of production in recent years. Seven plates, two appendices and a map showing the chromite mining lease blocks in Mysore, illustrate the brochure.

The Oxford School Atlas for India, Burma and Ceylon. By John Bartholomew, M.C., M.A., F.R.G.S., F.R.S.E., 64 pp. Oxford University Press. 1941. Price Re. 1 as. 4.

This is the tenth edition of a very serviceable popular atlas, specially prepared to meet the requirements of Indian pupils, available at a fairly low price. Besides physical and political maps of the several continents and of the world, the atlas contains world distribution maps showing climate, population and occupations, special and section maps of India (with insets of the chief ports). Other useful features of the atlas are:—Population statistics of India, British Empire and other countries of the world; mathematical and astronomical diagrams; comparative diagrams of physical geography; illustrations of mapping; explanatory notes on time, maps and map-reading; historical maps of India etc; and a complete general index (of names with pronunciation)—altogether a high value for moderate price. The atlas is recommended for use by pupils of secondary and high schools in India.

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