

APPENDIX TO THE REPORT
OF
THE COMMISSIONERS.

VOLUME XVIII.

MINUTES OF EVIDENCE

RELATING TO THE

GEOLOGICAL SURVEY OF INDIA
DEPARTMENT

Taken at Delhi, Calcutta, and London,

WITH

APPENDICES.

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MINUTES OF EVIDENCE

TAKEN BEFORE THE

ROYAL COMMISSION

ON THE

PUBLIC SERVICES IN INDIA

RELATING TO THE

GEOLOGICAL SURVEY OF INDIA DEPARTMENT

At Delhi, Tuesday, 4th November 1913.

PRESENT:

THE EARL OF RONALDSHAY, M.P. (*in the Chair*).

Sir MURRAY HAMMICK, K.C.S.I., C.I.E.

Sir THEODORE MORISON, K.C.I.E.

MAHADEV BHASKAR CHAUBAL, Esq., C.S.I.

ABDUR RAHIM, Esq.

JAMES RAMSAY MACDONALD, Esq., M.P.

And the following Assistant Commissioner:—

G. H. TIPPER, Esq., Assistant Superintendent, Geological Survey Department.

M. S. D. BUTLER, Esq., C.V.O., C.I.E. (*Joint Secretary*).

H. H. HAYDEN, Esq., C.I.E., Director, Geological Survey of India.

Written Statement by Officers of the Geological Survey of India.*

80,444. (I.) **Methods of Recruitment.**—The existing method is the most satisfactory that could be devised at present, viz., selection by the Secretary of State for India with the joint advice of the Director of the Geological Survey of Great Britain and of a former Director of the Geological Survey of India. Owing to the nature of their work, it is essential that members of the graded staff should have, in addition to a thorough knowledge of geology, certain qualities which cannot be tested by competitive examination. It is of the greatest importance that they should have tact and adaptability to enable them successfully to carry out their investigations during the long field season, and to avoid friction with the indigenous peoples—often in an extremely primitive stage of civilisation—amongst whom their work chiefly lies. At the same time, having to deal constantly with Europeans of all grades, both official and non-official, and with Indians of all ranks, it is important that, whether European or Indian, they should not be of inferior social standing. The most suitable type of candidate is that produced by the training given at the best British universities, and selection from among men of this kind who have taken high honours in geology is on the whole undoubtedly the best method of recruitment. It is possible that a suitable candidate may occasionally be found outside the universities, and the present method of advertising vacancies a year in advance results in widening the field of selection to include such men. It is furthermore of great importance that at least one member of the board of selection should have an intimate knowledge of the conditions under which geological work is carried out in India, and thus be able to eliminate candidates who, although

possessing all the necessary professional qualifications, are manifestly unsuitable, on the ground of other considerations, for service under the conditions prevailing in India. Such selection is ensured by the presence on the board of a former Director of the Geological Survey of India. Recruiting in India will be out of the question for many years to come; geological instruction is only in its infancy in this country, and the training given is totally inadequate to fit a man for the ranks of the geological survey.

80,445. (II.) **System of Training and Probation.**—No changes in the present system are recommended.

80,446. (III.) **Conditions of Service.**—We consider the present conditions satisfactory, except in so far as they relate to the number of superintendents. We suggest that the number be increased from three to five for the following reasons:—

1. It will render blocks in promotion less serious than at present. From 1914, for instance, assuming no casualties amongst the four senior officers, there will be no chance of promotion for any assistant superintendent for 10 years. The change suggested would have the effect of inducing experienced men to remain in the Department instead of retiring at the earliest opportunity.

2. It is the accepted policy of the survey to charge superintendents with the supervision of a field party, and the number of such parties is at present necessarily limited to three. The proposed change would make it possible to increase the number of field parties and also to retain a superintendent for employment in the office at headquarters.

3. As a result of the reorganisation of the Department in 1906 the ratio of superintendents' posts to lower graded posts was materially reduced. The proposed change would readjust the proportion approximately to the former value of 1:3, and remove a legitimate grievance on the part of junior officers.

80,447. (IV.) **Conditions of Salary.**

(a) *Sub-Assistants.*—We do not propose, in this note, to make any suggestions with reference to the sub-assistants, since their appointments are not gazetted. At the same time their interests have not been overlooked, and it is understood that recommen-

* This statement was signed by Mr. G. H. Tipper, Assistant Superintendent, Geological Survey of India, on behalf of the following officers:—Messrs. H. S. Bion, J. Coggin Brown, R. C. Burton, W. A. K. Christie, G. de P. Cotter, L. L. Fernor, C. S. Fox, H. H. Hayden, A. M. Heron, H. C. Jones, C. S. Middlemiss, J. J. A. Page, E. H. Pascoe, G. E. Pilgrim, G. H. Tipper, H. Walker.

Dr. Stuart, whose services were at the time at the disposal of the Government of Madras, also indicated his concurrence with these views.

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dations on their behalf will shortly be made departmentally.

(b) *Assistant Superintendents.*—The average age of entrance into the Department, calculated on that of its present members, is 26·3 years, the comparative lateness of entry being due in almost all cases to a long and correspondingly expensive university training. These years of study, with their resultant academic distinctions, are regarded as an investment, which may fairly be expected to meet with some adequate return. An officer is, however, on his arrival in India, posted to headquarters in one of the most expensive places in the world; he receives no Calcutta allowance, he is often burdened with some of the expense of his long training, and he finds that Rs. 350 per mensem, which sounded to him in England a reasonable salary, is insufficient for his bare requirements. His discontent is not tempered when he finds that the exchange compensation which his colleagues drew previous to 1907 is no longer allowed, although the cost of living in Calcutta has continued to increase. We suggest as a remedy that the initial salary of an assistant superintendent be raised to Rs. 500 per month. At present the maximum pay of an assistant superintendent is Rs. 1,000, a salary which he reaches after 15 years' service. This, we submit, is insufficient for the reasons adduced below:—

(1) Though it is impossible to put such a statement to a statistical test, it may safely be said that the qualifications possessed by the officers of the Geological Survey, whether viewed from an academic or a technical standpoint, are as great as those of any other professional service in India.

(2) The late age of entry into the Department as a factor does not meet with sufficient recognition under the present scale.

(3) The work of an officer of the Geological Survey, whether directed to economic or scientific ends, is essentially original research. Whether at headquarters or in the field it demands a concentration of thought, without which he cannot draw full or correct deductions from his observations, and if he is to be hampered by continual worry owing to the inadequacy of his pay, his efficiency will be seriously impaired. In the field his work is of an exacting character involving considerable physical exertion; he must be prepared at the shortest notice to proceed to any part of the Indian Empire; his duties often lead him to its unexplored areas, and to the still less known and still more dangerous trans-frontier regions. The geologist is always necessarily a stranger in a strange land, whereas, in the case of almost all other services, an officer tours in his own district, familiar with local conditions and able to make economical arrangements beforehand.

(4) The prospects of an assistant superintendent of promotion to the grade of superintendent are not favourable. If we assume that the present officers serve till they reach the age of 55, the average number of years which the present incumbents will spend in the lowest grade is 26·5. The figure is admittedly a maximum, but even assuming a considerable number of casualties and early retirements, and an increase in the number of superintendents' posts, his prospects of reasonably early promotion are small.

(5) An officer's recess period from, say, May to October, must be spent in Calcutta, where the headquarters of the Survey with its collections, library, and laboratory, are situated. House rent there is excessive. Debarred by the exigencies of his calling from leasing a house, an assistant superintendent finds after eight years' service that he has to pay one-third of his salary in rent alone. If a bachelor, he receives no allowance whatever; if his wife is with him, he draws a quite inadequate compensation of Rs. 90 per mensem, hedged round with irksome regulations. The climate of Calcutta is at its worst during this period, and if for that or any other reason his wife is not with him, even this compensation is disallowed.

(6) Members of other professional services are allowed to engage in private practice or draw allowances in lieu thereof. This is strictly forbidden to an

officer of the Geological Survey, although to quote Sir Thomas Holland, "there is no doubt that if our officers were permitted to accept private practice as in the case of the Indian Medical Service, their salaries would form but a small fraction of their income."

(7) To draw comparisons between the emoluments of professional geologists in India and those of the Geological Survey would be open to objection, as the nature of the work differs widely. A comparable instance may, however, be found in the case of an unsuccessful candidate for the Geological Survey, who, now in the employment of Government, is drawing, after a few years' service, emoluments greatly in excess of those of senior officers of the Geological Survey.

For these reasons we submit that the salary of an assistant superintendent should be Rs. 500–50–1,500.

(c) *Chemist.*—The case of the chemist, whose maximum salary is also Rs. 1,000 per mensem, may conveniently be considered along with that of the assistant superintendents. The age limit at entrance is 30 years, and he reaches his maximum pay after 10 years' service. The arguments adduced above, except those referring to initial salary and to promotion, apply to his appointment also. The present holder of the post is an honours graduate in geology as well as in chemistry, but has specialised in geological chemistry, as other officers have done in, say, petrology or palæontology. We suggest that he should be put in the same position as an officer on the graded list, his salary being revised to Rs. 500–50–1,500, with a possibility of promotion, if not to the grade, to the salary of a superintendent.

(d) *Superintendents.*—The present pay of a superintendent, Rs. 1,000–80–1,400, is the highest to which the great majority of officers of the survey can attain. This, we hold, is too low. The reasons which have been brought forward for an increase in the pay of assistant superintendents are applicable here, and with still greater force. It should be remembered that the superintendents represent the picked men of the survey, and their work is of a more responsible nature than that of the officers in the grade below. Should a superintendent leave the service at this stage, his value as a consulting geologist is greater than if he had retired before reaching it, on account of the wider experience and increased reputation he has acquired, factors which should be given due weight in fixing his salary. By the time an officer becomes a superintendent, he is likely to be married, with a family to educate, and his present meagre pay is insufficient under these conditions. The salary which we suggest as an adequate one is Rs. 1,500–100–2,000.

(e) *Director.*—As at present arranged, the pay of the director is extremely small for the officer entrusted with the direction of the geological survey and the investigation of the mineral resources of the entire Indian Empire, the production of which is now valued at some 12,000,000*l.* annually. It is the pay of numerous officers throughout India who are carrying out less responsible and less specialised duties, and is insignificant when compared with the incomes earned by consulting geologists having no higher attainments and far less experience than the average officer who rises to the post of director. We are strongly of opinion that the pay of the director should be fixed at the amount advocated by Sir Thomas Holland, viz., Rs. 3,000 per mensem.

We have purposely refrained from drawing comparisons between the conditions of salary in this Department and those obtaining in other professional services in India, not because such comparison would detract from the strength of our case, but because no other service, with the possible exception of the Survey of India, affords even an approximate parallel.

The above suggestions as to improved pay are based on those advanced by Sir Thomas Holland in 1905, although the scale advocated for superintendents and assistant superintendents is higher than that which he proposed. The arguments then adduced apply with greater force now, on account of the increased emolu-

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ments obtainable by private geologists, especially in India, and the consequent inducement to an officer to take his first pension as soon as he has earned it (as Sir Thomas himself did) at a stage when his services are becoming most valuable to the country. It should be remembered that the loss of such an officer means the loss of a fund of detailed geological information concerning the areas in which he has been engaged and the special problems he has studied—information which cannot be embodied in reports, but may be of great value to the Department and the public.

The recommendations which we regard as the minimum desirable are summarised below:—

	Present Scale.	Scale recommended.
Director - -	1 on Rs. 2,000	1 on Rs. 3,000
Superintendents	3 on Rs. 1,000-80-1,400.	5 on Rs. 1,500-100-2,000.
Assistant Superintendents.	16 on Rs. 350-30-500 and 500-50-1,000.	14 on Rs. 500-50-1,500.
Chemist - -	1 on Rs. 500-50-1,000.	1 on Rs. 500-50-1,500.

After Service of—	Proportion of Average Emoluments.	Maximum Rs. at 1s. 9d.
10 years - -	10/50 - -	2,500
11 " - -	11/50 - -	2,750
12 " - -	12/50 - -	3,000
13 " - -	13/50 - -	3,250
14 " - -	14/50 - -	3,500
15 " - -	15/50 - -	3,750
16 " - -	16/50 - -	4,000
17 " - -	17/50 - -	4,250
18 " - -	18/50 - -	4,500
19 " - -	19/50 - -	4,750
20 " - -	20/50 - -	5,000
21 " - -	21/50 - -	5,250
22 " - -	22/50 - -	5,500
23 " - -	23/50 - -	5,750
24 " - -	24/50 - -	6,000
25 " - -	} 25/50 - -	6,250
26 " - -		6,500
27 " - -		6,750
28 " - -		7,000
29 " - -		7,250
30 " - -		7,500

80,448. (V.)—Conditions of Leave.—We support the proposals for the simplification of the leave rules drawn up by the Government of India, Finance Department, on the lines suggested by the Decentralisation Commission, and recently circulated to local governments. As far as we understand them, however, they do not permit of the accumulation of more than three months' privilege leave, and in our opinion this restriction should also be removed.

Furlough Pay.—Under the existing scale of pay an officer proceeding on furlough after eight years' service draws 247l. 10s. per annum, and were he to combine nine months of his furlough with three months' privilege leave, he would draw for 12 months a total sum of 305l. As he cannot be expected to save any appreciable part of his salary during the first eight years of his service, he is compelled to encroach on his leave pay for most of his travelling expenses. If he is married, he finds as a net result that it is impossible for him to take leave out of India at all. We submit, therefore, that the rates of furlough pay stand in urgent need of amelioration. This would be effected by the enhancement of salary for which arguments have been brought forward under Section IV.—arguments which here find strong corroboration.

The suggestion of the Decentralisation Commission that furlough on half-pay might be commutable to shorter leave on higher remuneration would seem to form a suitable basis for reform of the existing rules.

80,449. (VI.) Conditions of Pension.—The scale of pensions at present in force is given in Article 476 of the Civil Service Regulations. This, we submit, is insufficient for the support of a married officer and the education of his children, especially as Government makes no provision for his family in the event of his death, and a considerable portion of his income must consequently be expended on insurance.

We suggest that the scale of invalid and retiring pensions should be modified as follows:—

Mr. H. H. HAYDEN called and examined.

80,451. (*Lord Ronaldshay*) The witness stated that he had been Director of the Geological Survey for the last three years. He came out to India in February 1895 as an assistant superintendent after obtaining his training in Geology at Trinity College, Dublin. He took up mining engineering at first, but specialised in Geology afterwards. He first took the ordinary Arts Degree, and then entered the Engineering School and took the Engineering degree of Trinity College.

and that the option of commutation of pension up to a limit of a quarter of the pension earned should be allowed as a matter of course, irrespective of the conditions set forth in Government of India, Finance Department, No. 585 E.B. of 27th September 1912. In the case of officers dying while in service, the commuted value of a quarter of the pension for the service qualifying at death should be paid to the widow and children of the deceased, the nearest exact age of the officer being taken in calculation for determining the commuted value of pension.

We suggest further that the extra pension of Rs. 1,000 per annum be granted to superintendents who have rendered not less than three years' effective service in that grade and have shown special energy and efficiency.

The condition necessary to obtain this extra pension that an officer, who joined after 31st December 1909, should have completed 28 years' service (*vide* Art. 475, C. S. R.), should be cancelled in view of the late age of entry into the Department. For this reason also, and on account of the arduous nature of the duties of an officer of the Geological Survey, the concession of optional retirement after 20 years' service should be continued.

80,450. (VII.) Such limitations as may exist in the employment of non-Europeans, and the working of the existing system of Divisions of Services into Imperial and Provincial.—(i) There are no limitations with regard to the employment of non-Europeans in the graded ranks of the Geological Survey; the Department is open to all, no distinction is made of nationality, creed or colour; so long as a candidate satisfies the Secretary of State that he is the most suitable applicant for a vacancy, he is appointed. Any alteration of this policy is highly to be deprecated; the cadre of the Department is so small, and its work is of such serious importance to the country, that it is essential that the best material obtainable should be procured, whether Indian or European.

(ii) There is no provincial service in the Geological Survey.

80,452. The Geological Department was a small one consisting of twenty-one officers, one of whom was supposed to be always away as Professor of Geology at the Madras University. Included in the twenty-one was the chemist and the officer acting as curator of the Geological Museum in Calcutta.

80,453. The Department had to work all over India. The primary object of the Geological Survey was to make a complete geological map, preferably on

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a scale of one inch to the mile, of the whole of the Indian Empire, with a view to the ultimate development of its mineral resources. That included the Native States so far as the Native States had no objection to the Department entering them, and they generally invited it to do so. In the course of their work they examined and investigated any mineral deposits and did all that was possible to bring the deposits to the notice of the general public. There was both a scientific and commercial side to the work of the Department, but they were not distinct, the one really being the complement of the other. To a certain extent officers were employed on purely economic investigations, one for instance having been told off to examine the manganese resources of India, others to examine the gold resources, coal, and so forth, and memoirs on those subjects were published. Under the orders of the Secretary of State only one-third of the Department was allowed to be engaged on work of that kind at one time, the others being engaged on the systematic survey of the country. The geological map would probably not be completed for some hundred years, and it was anticipated that the labours of the Department in the future would continue on the same lines as in the past.

80,454. He appeared before the Commission both as Head of the Department, giving evidence, however, only in his personal capacity, and also as one of those who had signed the written statement now before the Commission. This had been passed almost unanimously, but there was one complete dissentient, who had submitted a note of his own, and one partial dissentient, who had wished to introduce the subject of the subordinate non-gazetted staff. As that was not within the terms of reference, the other officers did not feel called upon to introduce it. It was noted in the written statement that the matter was being referred to Government departmentally. It was thought by the Service that it would be an advantage to the non-gazetted staff to leave them out of the note altogether. A third officer had also sent in a separate note on the subject of pensions. Amongst the officers were two statutory natives of India, one an Indian, and the other a European, educated for the most part in India.

80,455. The Department was recruited entirely from experts. The limit of age was nominally 25, with no minimum, but in actual practice the average worked out to something over 26. Men had entered as young as 21, and of the men now in the Department there were six who were under 24 at the time of joining. It was necessary that the men should have a sound geological training; a man with a merely general scientific training would be of no use at all. An endeavour was made to insist upon the recruits having qualifications corresponding to a first class University degree, such as the First Class Science Tripos of Cambridge or the First Class B.Sc. of London, or what were called in Dublin Special Certificates in every subject in the Engineering Examination, including Geology; and also actual practice for a year or two as geologists in England. Therefore the age limit for recruitment must necessarily remain high.

80,456. Regarding the state of geological education in India, there were courses in Geology for the B.Sc., and in the Calcutta University Geology was included in the syllabus for the degree of Master of Science. From his experience as a teacher, he was not very hopeful of the possibility of giving men sound geological instruction under present conditions. A man who lived on a mud bank could have no true conception of hills and rocks. In England a boy from his earliest childhood was accustomed to seeing mountain torrents, mountains, snow and ice, and probably collected butterflies, plants or fossils, and he came to his work with a general elementary knowledge which was lacking in the young man in India, although, of course, the Indian boy had a knowledge in many other subjects which the English boy did not possess. Their bent, he meant, was not towards a practical science like geology, and under present conditions it was almost impossible to make a man a first-class practical geologist no matter how well he did in his

examinations. A certain amount of progress was being made, but he thought the whole system of scientific education was wrong. It was necessary to begin at the bottom instead of at the top, and teach elementary science early in the educational career. Witness was of opinion that there would be no prospect of recruiting the Department from India for a long time to come if the present standard was to be maintained.

80,457. The statutory natives of India now in the Department were trained partly in India and partly in England. One (an Indian) was sent to England for a special course of study and took a B.Sc. degree at London; he was subsequently given a State Technical Scholarship and was for some time attached to the Canadian Geological Survey. Another, of European extraction, went to England on a State Technical Scholarship and took a very good degree in mining at Birmingham and was a good practical geologist. All the statutory natives of India who had been in the Department had been trained in England. If, other things being equal, the Indian was as good as the European, an appointment should be given to the Indian, but he did not think the standard should be lowered in order that local men might be employed. If an Indian was trained in England, he had the same chance, or even a better chance, of being nominated, because the Secretary of State was probably slightly biassed in favour of the Indian.

80,458. Recruitment to the Department depended entirely upon vacancies, and a vacancy now occurred about once a year, whereas when he joined there had not been an appointment for about five years. He would not recommend competitive examination in Geology, though the method of appointment in England now was essentially competitive, because the men who presented themselves for appointment were examined by the Head of the Geological Survey of Great Britain and also by one who had a practical acquaintance with Indian conditions, and the candidates were given marks for everything.

80,459. With regard to the necessity for an extra superintendent, personally he had had great difficulty in the last year or two in adjusting his parties. The Department was split up into three parties, one dealing with Rajputana and Bombay, another with the Central Provinces, and another with Burma, and the correspondence of the office had increased so enormously of recent years that it was necessary to have a responsible man at headquarters, when he himself was on tour, and therefore he wanted a superintendent for that purpose. It would not be advisable to place a junior man in charge of the office since he might have to retrench a senior officer's travelling allowance bills or make investigations with regard to charges that appeared to be irregular. The main point, however, was that the officer placed in charge of the office must have had wide experience in order to deal with the very miscellaneous inquiries received from Local Governments and private individuals. At present there were three field parties, and he required four, and it was practically essential to have a superintendent in charge of each party.

80,460. With regard to the assertion in the written statement that experienced men were now retiring at the earliest possible opportunity, during the last twelve years one man had left to take up the Professorship of Mineralogy at Toronto, where he was allowed to take private work. He was now one of the leading authorities in America and Canada on ores of the nickel-chrome group. Another retired as soon as he could get his first pension, about three years ago, and took up work in England and was believed to be making a very large income. Another was a mining specialist who came out on Rs. 900 a month, and no pension, but within four years he resigned, and was now making between 3,000*l.* and 4,000*l.* a year as consulting geologist chiefly in matters relating to gold. Another mining specialist did not consider the Geological Survey good enough, and when the new Mines Department was started joined that Department. Another officer resigned recently after seven years' service in order to take up private work in

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Burma. There was another officer who proposed to retire and take up private work as soon as he could do so. Also, one of the ablest men in the Department had had very tempting offers made to him, and it was doubtful whether he would remain. Many of those men could, or did, command incomes of 3,000*l.* or 4,000*l.* a year.

80,461. The Department was reorganised in 1906, and the recommendations then made by the director were accepted only in a modified form and the pay given was considerably less than that proposed. He had been told by an officer who had recently been in England endeavouring to recruit for a certain Department in India a staff of scientific men with University qualifications, that the Secretary of State had circularised all the home Universities and Colleges and was informed that no one would accept posts starting at Rs. 600. The same officer had also informed him that the average man preferred to go to the Crown Colonies, and even to the Malay States or Nigeria, rather than to India. It was said by a mining professor in England that no qualified Mining Engineer with a sound knowledge of geology would now accept less than 1,000*l.* a year in a tropical country, there being such a demand for technically trained men for commercial work. Of course, such terms did not include pension, &c., but in one case they included a Railway Provident Fund which was rather better than the pension of the Department. The present terms offered by the Department were not sufficient to attract the recruits that were required,* and recently three men he would have liked to obtain had preferred other work.

80,462. On the subject of pay, witness considered that it was impossible to compare the Indian rates of pay with the British. The pay of the Geological Survey in England commenced at about 150*l.* a year and the Director of the British Geological Survey drew 1,000*l.*; the pay was much smaller, but the conditions were different. Indian living was more expensive than English.

80,463. With regard to leave, the suggestion was that officers should be able to accumulate more than three months' privilege leave, and he thought in the long run it would be to the interest of the Government to permit that. Furlough pay was inadequate and made it difficult for a man to take furlough out of India. He knew of one man who had not taken leave for nearly twenty years simply because he could not afford to take his wife and children to England.

80,464. On the subject of pension the witness stated that the maximum amount anyone in the Department could draw was 525*l.* after 25 years', and the same after 30 years' service; this included the extra Rs. 1,000 a year if he had been director for three years and his work had given satisfaction to Government. Comparing that with the maximum pension

given to the Survey of India, whose work was somewhat analogous, it would be found to be over 15 per cent. lower. Under the present rules, after 20 years' service an officer could draw a pension of Rs. 4,000 a year: the officers of the Geological Survey had an extremely rough and often unhealthy life, and it would become more so in the course of time when the unhealthy districts had to be opened up. From the point of view of the Department and recruiting, he thought on the whole it would be advisable to retain the 20 years' pension. With favourable conditions men would probably not leave after that period. Officers were not allowed to take private practice, and he thought that restriction should still be maintained. If a man took up private work he would be liable to ask for leave at all sorts of inconvenient times, and would be exposed to temptations from which he ought to be protected.

80,465. (*Sir Theodore Morison.*) The witness said the pension after ten years' service was an invalid pension, and he proposed to keep the retirement pension after twenty years on the same conditions as at present. To acquire a real commercial value a man had to spend three or four years in the Department, but he had from the outset a certain value, more than a young chemist. About ten or twelve years ago the companies who were engaged in the exploitation of certain minerals in India scoffed at the idea of a geologist being of any use to them, but now they had staffs of nine or ten geologists drawing large salaries. One man after eight years' service was getting 800*l.* a year, and first class passage both ways and full pay when on leave. That encouraged young men to look for private work, and consequently the young geologist has a greater potential value than the average young chemist. The training in the Department enormously increased a man's value. Seventy per cent. of the present members of the Department, having eight or more years' service, would make two or three times their present pay if they retired, and many of them a great deal more. Every man did not go after 20 years' service, but as a rule the Department would certainly lose the best men on account of their commercial value being so high. There was no one in the service now except himself and one other officer who could retire under the 20 years' rule.

80,466. (*Mr. Abdur Rahim.*) The witness said the Indian student was good at book-work, but could not put his knowledge into practice, and there were no means of teaching him practically. Unfortunately the chief Geological Institution in India was on a mud bank. For a study of geology some Himalayan station was needed, and he thought Shillong would be an ideal and Mussoorie also perhaps a suitable place. The reason he considered that the Indians recruited in England would stand a better chance than Europeans was that he thought the Secretary of State would prefer to appoint an Indian, if the Indian was of the same calibre. Pure geology was not the only qualification required. If facilities were given for recruitment in India it would mean a lowering of the standard because there was in India neither the suitably prepared material on which to base higher teaching, nor suitably situated institutions to give the teaching. He was not sure that it would be wise to encourage scholarships for the study of geology in England, if the fact that a man had held a scholarship was to give him a lien on a Government appointment. There had been cases which had caused much disappointment.

80,467. (*Mr. Macdonald.*) The witness said his suggestion was that the Government should do something to protect the Department from competition with the commercial world, and he thought that would be done by raising the pay, even though the commercial world offered 3,000*l.* or 4,000*l.* a year, because the average man who came out to India was a man who was prepared to take up science in preference to commercial work, and if he found the conditions to be such that he could live in India, educate his family and go to England to see them occasionally, he would continue to prefer scientific work. The difference

* Mr. HAYDEN afterwards wrote as follows:—

"Since my evidence was given, I have heard from Sir Thomas Holland that there were three good applicants for the appointment made a few months ago to fill an existing vacancy in the Department. Nevertheless this does not alter my opinion, for I believe it to be due almost entirely to the lively interest taken in our recruiting by Sir Thomas Holland and to his personal influence; in proof of this it is only necessary to compare the class of recruit obtained immediately before with that obtained immediately after he was asked to assist in the selection. If his personal influence were removed there is no reason to suppose that the difficulty of finding suitable men would be any less than it was five years ago, for the general discontent with present rates of pay which prevails in the Geological Survey must inevitably react on our recruiting. A candidate for appointment, unacquainted with India, is disposed to look upon the scale of pay of the Department as generous until he joins, when he finds that what, in his ignorance of Indian conditions, he regarded as affluence is merely a bare living wage, especially in such an expensive place as Calcutta; he consequently becomes discontented, and his friends at home soon hear of it; if, as most of us do, he has kept in touch with his University, future students are warned not to be misled by the apparently high rates of Indian pay, which are merely illusory. Individual cases of discontent might have no particular effect, but when the feeling is general, as it now is, it cannot fail to react at home to the detriment of the Department."

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between Rs. 1,000 and Rs. 1,500 was sufficient to give a man a margin for saving. The opportunities for scientific research in India were unusually great, and if a man had scientific ambition a little encouragement would help to keep him in the service.

80,468. With regard to the remark in the written statement that the Geologist was always a stranger in a strange land, whereas in the case of almost all other services an officer toured in his own district, the point was that it was not quite fair to compare the pay and allowances of the Geologist with those of the district official, whose headquarters were in his district and who had facilities for making his own arrangements throughout the district. The Geologist had long distances to travel, and often great difficulties in making arrangements for supplies and so forth. He really thought that the Government by increasing within reasonable limits the pay of its staff could secure the genuinely scientific man who did not care much about increased income provided he could live. In the matter of recruitment they did not want to put the Department into direct competition with commercial firms at all.

80,469. In reply to the suggestion that it might be advisable to recruit men well trained in theory and with a certain amount of field practice on a scale of pay not quite so good as that recommended in the written statement and to retain them only for eight years and to allow them to leave after that period, their vacancies being filled up as they occurred, the witness said that under those conditions the work of the Department could not be carried on efficiently. It was necessary to have men with experience. The position was different from that in England. England was a country that had been geologically surveyed throughout and the geologists there were now doing extremely detailed work. In India, on the contrary, they were working on very broad lines and it was only when a man had fifteen or sixteen years' service that he was really capable of taking charge of a field party. He must know not only the geology of his Province but the geology of the whole of India. If men left the Department after ten years' service, the work would be bound to suffer.

80,470. (*Mr. Chaubal.*) The witness said the Geological Department had existed since 1853. Provision began to be made for the study of Geology as a science in the Indian Colleges in the seventies, when classes

were held at Rurki College and in the Presidency College in Calcutta. Serious teaching did not begin until twenty-five years ago, and he thought it began in Calcutta Presidency College under Sir Thomas Holland. Indian geology in England was included in a general course of geology, but Indian geology was taught in India rather to the exclusion of foreign geology. Although the Department had existed for sixty years no serious steps had formerly been taken, except in Calcutta, to give people a real scientific training in geology as a subject. There was no teaching at all in Bombay. He thought the whole principle of training was wrong. If a right principle of training were adopted more hopeful material might be obtained in India. If a competitive examination were held in England both for Indians and Englishmen in the subject of Geology it was probable that in nine cases out of ten the wrong man would pass in. If the men were first selected and then allowed to compete he should have no objection. If the candidates were not selected first, men might pass whose physique would not stand the work. It was not so much the danger of getting the wrong class of Indian as of getting the wrong class of European. A man was required with a good deal of tact and knowledge of the world, as he had to deal very intimately with the people in the districts. As a matter of fact scientific geological work in India really required very close contact with and sympathetic treatment of the people, who were very averse to pointing out the mineral deposits. There was no departmental examination. Officers had to pass in Hindustani and of course picked up other languages. The system of competition was tried in Mysore and was given up almost immediately.

80,471. (*Sir Murray Hammick.*) On the subject of allowances the witness said a bachelor officer who had to live in Calcutta for the recess received absolutely nothing, nor did he get anything extra if he was in charge of a party. The travelling expenses allowed were Rs. 10 a day and everybody received the same. A married man living in Calcutta for the recess received an allowance of Rs. 90 a month in the hot weather and Rs. 175 in the cold weather if his wife was with him, but if she was away for more than two months excluding the months of departure and return he got nothing. If an officer remained more than ten days in one place without special sanction, he might get no allowance at all.

The witness withdrew.

At Calcutta, Wednesday, 21st January 1914.

PRESENT:

THE EARL OF RONALDSHAY, M.P. (*In the Chair.*)

Sir MURRAY HAMMICK, K.C.S.I., C.I.E.

Sir THEODORE MORISON, K.C.I.E.

MAHADEV BHASKAR CHAUBAL, Esq., C.S.I.

ABDUR RAHIM, Esq.

And the following Assistant Commissioner:—

G. H. TIPPER, Esq., Assistant Superintendent, Geological Survey Department.

M. S. D. BUTLER, Esq., C.V.O., C.I.E., (*Joint Secretary.*)

P. N. BOSE, Esq., late Deputy Superintendent, Geological Survey of India.

Written Statement relating to the Geological Survey of India.

80,472. (I.) *Method of Recruitment.*—(a) *Superior Service.*—At present, whenever there are vacancies, the Secretary of State advertises them and makes a selection from among the applicants according to the advice of his geological referee, who is a retired member of the Geological Survey of India. As the candidates do not make any special study of Indian Geology, there is no necessity for the appointment of an Anglo-Indian expert to judge of their qualifications. There is certainly strong objection to such a judge in the interest of Indian candidates. One of the heads of the Geological Survey of India, Mr. Medlicott, was strongly of opinion that Indians were incapable of scientific research. Several other Anglo-Indian gentlemen have been known to hold similar views, There are others, again, who apprehend danger to the prestige of the British Government from the employment of Indians

to do very important and responsible work even if they had the capacity for it. They consider the suppression of the capable Indian to be essential for the maintenance of British prestige in India. For instance, Surveyor-General Colonel De Pree, who for some time controlled the largest Scientific Department under the Government of India, said in a memorandum submitted to the last Public Service Commission:—

“It is suicidal for the Europeans to admit that natives can do any one thing better than themselves. They should claim to be superior in everything, and only allow natives to take a secondary or subordinate part. In my old parties I never permitted a native to touch a theodolite or an original computation, on the principle that the triangulation or scientific work was the prerogative of the highly paid Europeans; and this reservation of the scientific work was the only way by

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which I could keep up a distinction, so as to justify the different figures of pay respectively drawn by the two classes, between the European in office time and the native who ran him so close in all the office duties. Yet I see that natives commonly do the computations nowadays, and the Europeans some other inferior duties."

"Both classes of Europeans (official and non-official)," observes Sir Henry Cotton, "are equally reluctant to admit the natives to equality, and the official class is especially aggrieved, because the natives are invading preserves which have hitherto been free from any intruder."

It is but seldom that we have such frank admissions. There are, of course, Anglo-Indian gentlemen who are more impartial and more sympathetically disposed towards the Indians than men like Medicott and De Pree. For instance, Dr. Oldham, the first head of the Geological Survey of India, had "the most unshaken confidence that with even fair opportunities of acquiring such knowledge (that of the Physical Sciences) many Indians would be found quite competent to take their place side by side with European assistants either on this Survey (the Geological Survey) or in many other ways."

That men of the Oldham type, however, are in the minority in the Indian administration is inferable from the fact that it is not their views but those of men of the Medicott or De Pree type which have so far shaped the policy and determined the course of action of the Government of India.

Under these circumstances, it is highly desirable that no Anglo-Indian gentlemen should act as advisers to the Secretary of State in making scientific appointments. I would suggest the formation of a British Committee of experts in all the branches of natural science for advising the Secretary of State whenever he has to make such appointments. A sub-committee of this body composed of three experts, one in Stratigraphical Geology, another in Petrology, and the third in Palæontology, would do for making appointments in the Geological Survey of India. It is desirable that the President of the Geological Society of London should be a member of this Sub-Committee. Before making a selection they should subject the candidates who may offer themselves to a competitive test.

(b) *Subordinate Service*.—There is as yet no adequate provision for the teaching of Geology in any institution in India. There are, so far as I am aware, only three Government Colleges in India where the subject is taught—the Presidency Colleges in Calcutta and Madras, and the Poona College of Science. The Lectureship at each of these institutions being an appanage of the Geological Survey of India, the Lecturer is constantly changed according to the exigencies of that Department. Ten years ago, the average term of a Geological Lecturer at the Presidency College, Calcutta, was about two years. The greater portion of his time was taken up by survey work, and it was only for four or five months during the recess that he was able to devote four or five hours a week to his duties at the Presidency College. Geology has grown so largely of late that even a whole-time man, however able, could do but scant justice to all its branches. For effective teaching it would be desirable to have a Specialist Professor for each of its three main branches—General Geology, Mineralogy, and Palæontology. One can easily imagine, therefore, what progress might be expected from the intermittent lectures of a professor changed every two years or so in the average who had to be away from Calcutta during the healthiest part of the year, and who had to perform his professional duties along with those of a Department by which he is employed as a permanent whole-time officer. When I occupied the chair of Geology at the Presidency College, Calcutta (1901-03), I drew the attention of the Educational authorities to this unsatisfactory state of things and had a permanent laboratory assistant appointed not without some difficulty. But even with his help I found I could do but little justice to the duties of my post. Matters improved a little after my retirement while Mr. Vreden-

burg was Lecturer, in that he was given duties at the Geological Survey office which kept him in Calcutta throughout the year. Under his teaching, which was far more systematic than ever before, graduates were turned out, the picked among whom might be employed in the superior service. But latterly matters have, I am informed, become as bad as before. Until Government takes steps to make geological teaching more efficient than at present, recruitment for the superior service would have to be effected in England. But even with the present teaching some of the geological graduates turned out by the Universities are quite competent to carry on the work of the Geological Survey under the supervision of an experienced officer of the superior service. In one respect they have an advantage over the English recruit. They are better grounded in Indian Geology at the start. At present for want of suitable openings they generally take to the legal profession, in which their geological knowledge is wasted. If the number of sub-assistants be gradually increased from two to twelve the Geological Survey would advantageously absorb a good number of them. The two sub-assistants now on the Survey are reported to be doing useful work, and there is no reason why more men of the same calibre should not be found.

If the increase just suggested be effected, the number of Assistant Superintendents could be reduced from 15 to 10 without any detriment to the work of the Survey, as much of the work which is done by them now would then be done by the sub-assistants. The reduction would also provide for the increased expenditure on sub-assistants. Prior to 1906, the sanctioned staff of the Geological Survey embraced seventeen gazetted appointments (including the Director and the Palæontologist). Two of the appointments, however, were kept open—one to provide the pay of the two sub-assistants and the other to meet the cost of palæontological work. So, in practice, the number of gazetted officers never exceeded 15. The adoption of my suggestion would mean reversion to this number.

Of the ten Assistant Superintendents of the Superior Service, three should be permanently located in Calcutta, one as Curator, another as Palæontologist, and the third as Professor of Geology at the Presidency College (until the appointment of a permanent Professor). The present system of continually changing these officers should be discontinued, as it leads to inefficiency. If my scheme be adopted there would be available six or seven Assistant Superintendents (who would be mostly junior and inexperienced officers) for field work, and the normal composition of each field party would be:—

One Superintendent (or a senior Assistant Superintendent).

Two or three Assistant Superintendents.

Three or four Sub-Assistants.

The step I recommend would not lead to economy, at least in the immediate future. But from the Indian view point its advantages would be immense. The aim of a Geological Survey is twofold:—(a) Development of the mineral resources, and (b) Geological research.

In regard to the first of these objects, unless it is effected by indigenous agency, the gain of the country is inconsiderable, if not altogether problematical. Extended employment of Indians on the Survey would be an incentive to geological training, and would thus gradually disseminate among the Indians a knowledge of the mineral resources of their country and of the methods of their utilisation.

As regards the second object of a Geological Survey—research for the advancement of geological science—it is a worthy one, but so far as the Government of India is concerned, it should obviously be carried out by encouraging research among the people of India. The Geological Survey of every country is manned by officers recruited in that country, and that should be the goal of the Geological Survey of India.

The designation of the officers of the Subordinate Service may be changed from "Sub-Assistants" to simply "Assistants." Deserving officers of the Subordinate Service should be promoted to the Higher Service. But as this provision may, for various

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reasons, remain a dead-letter, I would suggest that they be afforded facilities after five years' service to proceed to England and compete for the Higher Service.

In regard to the recruitment of the Subordinate Service, it should be effected by competition, as in the case of the Higher Service.

80,473. (IV.) Conditions of Salary.—(a) *Superior Service*.—The scale of pay for the Superior Service as revised in 1906 is fairly liberal and should attract high-class men. In order to make the service still more attractive, I would allow the officers to take private engagements. For short terms a scale of fees should be fixed by the Government according to the standing of the officers; and they should be entitled to a certain percentage of the fees. For long periods the services of the officers would be lent. At present it is difficult for private parties to secure the services of competent geologists to examine and report upon their properties. I see no valid reason why the Survey should not come forward to help them, the development of the mineral resources of the country being one of its main objects, especially as by rendering such help a part at least of the expenditure on it would be recouped. Besides, the calls for advice from the public and the way in which they are met would be a test of the utility of the Geological Survey Department. If the advice of the Survey officers be not sought for to the extent it should be, the Government might con-

sider the advisability of substantially reducing its strength. Though there is, I believe, a rule prohibiting Survey officers from taking private engagements, it was not enforced until 1895, when my services were requisitioned by a European firm in Calcutta to examine a coal property for them. Though I was on furlough at the time, Government did not allow the firm to avail themselves of my services.

I think it would be well for the chemical laboratory of the Survey to make assays for the public on terms similar to those on which the Mint undertakes them at present. The expenses on the laboratory would then be recouped to some extent, and the public would have the benefit of authoritative and reliable analyses.

(b) *Subordinate Service*.—The initial pay of officers in this service now is Rs. 150, and it rises by an annual increment of Rs. 10 to Rs. 300 in 15 years. If my proposal in regard to the increase of their number be adopted, I would suggest their gradation as follows;—

First Grade, two officers, Rs. 350—30—500.

Second Grade, four officers, Rs. 250—20—350.

Third Grade, six officers, Rs. 150—10—250.

Officers of this service should, like those of the Superior Services, be permitted to take private engagements and be paid a certain percentage of the fees, which may be prescribed for such engagements by Government.

Mr. P. N. BOSE called and examined.

80,474. (*Lord Ronaldshay*.) The witness had been in the Geological Survey Department for 23 years. He began as an Assistant Superintendent, and became a Deputy Superintendent, and for some time officiated as a Superintendent. The Deputy Superintendent's grade was now abolished. He was recruited in England by the Secretary of State, and retired from the Service in 1913.

80,475. The teaching of Geology was not so good in India as in England. The system under which a member of the Geological Survey Department was deputed in his spare time to do the teaching work of the University was not wholly satisfactory, and there ought to be a whole-time professor. Some experience of Indian Geology was, however, necessary, and the best professor would be one who had served in the Geological Survey as a Superintendent for a number of years. When appointed professor he should be removed from the regular cadre of the Department.

80,476. There was a good deal of truth in the contention that it was difficult to give adequate instruction in Geology in a place like Calcutta, as young men brought up in an alluvial area, like Bengal, would have little conception of other Geological formations, but that could be overcome by students being taken to visit places like the Central Provinces or Western Bengal, where instruction in other formations could be obtained. England was an ideal place for geological study, owing to the large number of formations represented. As a matter of fact, students in Calcutta were now taken on tour into mountainous districts under the supervision of a teacher. The Indian Geological graduate would know more of Indian Geology than a Geological graduate from England, who had made no special study of the Geology of India.

80,477. The suggestion to recruit young Indians in India and to send them with State Scholarships to England was a good one, if one recruit was sent every year. This would be more satisfactory than the arrangement he had proposed for developing a subordinate service. He was not aware that the head of the Geological Survey of Great Britain advised the Secretary of State with regard to the selection of recruits in England, and was under the impression that a retired member of the Geological Survey of India acted as the sole referee. He was not in favour of the latter course, as a retired member of the Geological Survey of India might have a certain amount of prepossession in favour of Europeans. He had no knowledge of any difficulties in securing candidates on the present terms, and thought

that if vacancies were properly advertised many would come forward. In his own time there was always a sufficient number of candidates.

80,478. Under present conditions the mineral resources of India were being developed by foreign agency. The management was foreign, the capital was chiefly foreign, and the profits were all taken out of India. India gained only from the employment of natives of India as miners, &c. If more Indians were in the Geological Survey encouragement would be given to Geological training, a Geological knowledge would be spread throughout India, and people would be led to take an interest in the development of the mineral resources of the country. At present the publications of the Geological Survey were sealed books to the majority of the people, and there were even educated men who had no knowledge of the existence of the Department.

80,479. He was in favour of members of the Geological Survey being allowed private practice, and did not think there would be any special temptations to them to profit themselves. An officer engaged in private practice would still be doing Geological work and contributing to the stock of knowledge of the Department. According to Sir Thomas Holland, officers of the Geological surveys in other countries were allowed to take private practice, and there were good openings for private practice in India, and those openings were increasing, especially in Burma. He had himself been engaged in private practice.

80,480. (*Sir Murray Hammick*.) He did not think that private practice in Geology was on a different footing from private practice in other departments, in that it occupied more time. The work might occupy a week or a fortnight, but the officer would be really doing Government work which was paid for by other people. Only a certain percentage of the fees obtained would be paid to the Geologist, the remainder being credited to Government. The officers of the Mint were allowed to make analyses for private persons and were paid a percentage of the fees obtained.

80,481. The real reason, no doubt, for the employment of so few Indians in the Department was that so few had an opportunity in India of mastering the science. The material was good, but the teaching was insufficient. One cause of that was the fact that the Professor of Geology was changed too frequently. If Geology was to be taught in India as it was taught in England, professors would be required for Geology, Petrology, Mineralogy, and Physiography. Until the Universities or Government spent a large amount of

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money on Geological teaching, Indians, as a rule, would not be fit for employment in the higher branches of the Geological Survey; but the present graduates would do very well for a subordinate service, and as the teaching continued to improve, they might become fit for the superior service. The best of English graduates would not come to India, and the picked Indian graduates under the present system of teaching would, perhaps, be equal to the second grade men from England. Accordingly the picked men in India might perhaps do as well as the men who were likely to come out. At present, of course, the picked Indians had nothing like the opportunities of learning Geology which the second-rate men had in England. The appointment of one full-time Professor would make a good deal of difference, because he would have as assistants graduates from Indian colleges.

80,482. With regard to recruitment, his view was that four or five candidates should be submitted to a competitive test, and on the results of that examination the best man should be selected. It was really a competitive examination that he proposed. It was possible that there were men who at that age would show aptitude for passing examinations, but who were in no way fitted for the life of an officer in the Geological Survey, but the examination would not be a competitive examination similar to the competitive examination of the Indian Civil Service. The Geologists on the Selection Committee would employ tests that would enable them to judge of the real qualifications of candidates for the work. If young men were sent to England with State scholarships, it would not always be possible to say whether they would turn out good scientists, although intellectually very brilliant. Therefore, it would not do to promise an appointment, but if a man proved himself to be a good student and passed the test, he should be appointed.

80,483. (*Mr. Chaubal.*) An Indian graduate trained in properly equipped colleges would have advantages over an English graduate, owing to his better acquaintance with Indian Geology. Such graduates might enter the subordinate department, and after five years' service should go to England and compete for the higher service. In England there were opportunities of study and practical work which were not at present to be found in India. For an Indian graduate well grounded in Geology, one or two years in England would be quite enough to fit him for the superior service of the Department.

80,484. He had proposed that the Director of the Geological Survey in India should not serve as an adviser to the Secretary of State, in order to remove the impression that the selection was not fair to Indian candidates.

80,485. The suggestion that an Indian student was not so capable of acquiring an expert knowledge of Geology on account of his not taking up the study of natural history or fossils during his childhood was one to which he attached no importance.

80,486. Although there was a rule prohibiting officers from taking private engagements, it was not

put into force until 1895. Up to that time officers in the Geological Survey, notwithstanding the rule, were in the habit of accepting private engagements, and he did not think it affected their work in the Department. If the remuneration for the work was credited to the Government, and the officers given a percentage, there was no reason why private practice should be detrimental.

80,487. (*Mr. Abdur Rahim.*) At the present moment there was not a sufficient opportunity for studying Geology in India, owing to the inadequacy of the staff of teachers, and the fact that there was no geological formation in Bengal for practical teaching. It was very necessary, however, to encourage the study in India, and for that purpose Calcutta was the best place, because it had the Presidency College laboratory and the museum. For the study of other formations it was quite easy for students to visit Darjeeling or any other place in India. There was no centrally situated place where it would be possible to study Geology properly without going far afield, as the geological formations were scattered far and wide. In England students were taken periodically on long excursions for practical study.

80,488. There was a good deal of difference between the present teaching in England and in India, but there was the nucleus for an advance in India in a well-equipped laboratory and a good museum in Calcutta. When he was Lecturer at the Presidency College, the students were taken out for practical study during the Puja holidays, and now they were taken on very long excursions, going even as far as Kashmir. There was really no insuperable difficulty in the way of studying Geology in India.

80,489. (*Sir Theodore Morison.*) It would be a good thing to concentrate the teaching of Geology into one particular centre, with a large Government grant, but he did not know how far that would suit students from Madras and Bombay.

80,490. The career open to Geological students outside the Geological Survey Department was rather precarious, and most students, who took Geology for the B.A., became pleaders. There were two men in Calcutta who were in private practice as consulting Geologists. Even if there was a good central school of Geology in India there would not be much work for the students outside the Geological Survey Department except a few private engagements, in the development of mineral resources. But they would not be worse off than men who took up Moral Philosophy, or History, or Economics, as Geology would be quite as good a training in culture. The chief object, however, of students would be to enter the Geological Survey.

80,491. (*Mr. Tipper.*) He had no first-hand knowledge as to how the selection of candidates was made in England, and was glad to hear that it was on the lines laid down by himself in his written statement. He was not aware of the fact that King's College in London now gave special courses in Indian Geology.

The witness withdrew.

P. N. DATTA, Esq., late Assistant Superintendent, Geological Survey of India.

Written Statement relating to the Geological Survey of India.

80,492. (I.) **Methods of Recruitment.**—The method of recruitment into the Geological Survey of India has hitherto been by nomination by the Secretary of State for India.

As neither the Secretary of State for India nor the India Council are supposed to be experts in Geology, the Secretary of State is assisted in the selection of candidates for appointment by Geological experts as advisers. Hence it is obvious that the Geological Advisers to the Secretary of State must form an important factor in the final selection of candidates for the Geological Survey of India.

As the practice has hitherto been for a retired member of the Indian Geological Survey—generally a Director—to serve in the capacity of a Geological

Adviser, it (the practice) looked at from an Indian point of view, calls for a few remarks. Mr. Blanford acted in this capacity for a good many years, and the late Director (Sir Thomas Holland) is one of the present advisers.

It is not quite clear why a retired member of the Geological Survey of India should serve as a Geological Adviser to the Secretary of State for India. For it is not obvious that there is any such necessity for this step at all; for, in the first place, it is not required of the advisers to see that the candidates possess any special knowledge of Indian Geology at the time, nor is it essential at all that they should do so. This special knowledge is acquired as the person appointed goes on with his work on the Survey. In the second

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place, it cannot be that the long personal residence of a Geological Adviser may be of help in the selection of the candidates physically, for there is the Medical Board the members of which are generally Anglo-Indian medical men) to see that the men are physically fit. In the third place, the Geological Survey of India has nothing to do with politics, and thus the advice of the man who has been "on the spot" is not a necessity in the selection of a candidate for the Survey. Thus, neither from a medical nor political point of view, nor from the point of view of special knowledge of Indian Geology, the help of an Anglo-Indian Geological Adviser is required. But it may be urged that the man "who has been on the spot" would be of help in detecting the right temperament of a candidate, that is to say, the temperament that would enable the candidate to pull on with the local officials in India and to get on amicably and smoothly with the various peoples inhabiting the different parts or frontier regions of India. This actually sounds plausible, but is yet without cogency. In the first place, in the selection of candidates even for the Civil Service of India the examination for the right temperament finds no place. There is a test there for soundness of physique and a test for skill in riding, but none as to fitness as regards temperament. And if that is so in the case of Civil Service candidates, that is, candidates who will be habitually coming in actual contact with, and living among, the various peoples and tribes, during their entire service in India, it seems strange that this test should be regarded as necessary in a Department that is purely scientific, that is to say, a Department where the officers have very little to do with the people themselves, and where their work is confined entirely to the inanimate rocks and minerals alone. No doubt when the Director of the Department visits a part of the country, he may have to come in actual personal contact with the local officials, but ordinarily the members of the Geological Survey have personally very little to do with the local officials. When a district is about to be surveyed, the district officers are informed of the intended visit of the Geologist by the Government of India through the Local Government. All that the Geologist has to do is to inform the district officer as to when his district is to be visited, asking him to furnish a *purwana* or circular letter, and Tahsil chuprasias, if need be, to enable him to get coolies and supplies. And when he has got this *purwana* (with or without the Tahsil chuprasias) he has nothing whatever further to do with the Deputy Commissioner or District Magistrate, as the case may be, during the entire time he may be working in the district. "The field duties involve no intercourse with the inhabitants—the Geologist goes about with map, hammer, and compass, and need not interfere with no one," to use Mr. Medlicott's words (Records, Geological Survey of India, Vol. XX., 1887, Part I., page 11). As for dealing with the primitive tribes, there exists no chance of friction with them if the supplies obtained are properly paid for, and if there is no attempt to use *zulum*, i.e., force and violence, against the local inhabitants. So a Geologist who is provided with a *purwana*, and does not resort to force or violence, has no difficulty whatever in prosecuting his researches with perfect ease and freedom. In the second place, assuming that an examination for temperament, though not necessary for the Indian Civil Service, is yet necessary for the Indian Geological Survey, it must be admitted that such an examination is extremely difficult if not altogether impossible to conduct. It seems impossible to tell, either from looks or from conversation extending over a few minutes, what a candidate's peculiar temperament may be. Further, it must be admitted that such an examination, if necessary at all, must be necessary alike for European and for Indian candidates, and even more necessary for the former than for the latter. An Indian officer is more likely to get on smoothly with the natives than a European officer, i.e., on account of his more intimate knowledge of the language and customs of the people than his European colleague. Yet no European candidate for the Geological Survey has yet been known to be rejected for

unsuitability of temperament, whereas at least one Indian candidate has been. Sir Thomas Holland is said to have recently told an Indian student who had taken his M.Sc. degree at Manchester that he might otherwise be qualified for an appointment on the Indian Geological Survey, but that his temperament was not suitable for it.

I will close this part of my Note with a single further remark. The camp of an English officer, in this Department, was a short while ago set fire to by the headman of the village where he was camping. No importance need be attached to such an incident, for the young officer in question is a promising Geologist, and the headman may have been chiefly to blame. Yet, were the officer an Indian, the incident would in all likelihood be, I fear, magnified out of all proportion, and used to illustrate the incapacity of Indian officers to get on with the people. If, then, the Geological Survey is a Scientific Department whose object is the prosecution of scientific work, surely the main object should be to see whether a man is properly scientifically trained and fitted, and not what his temperament may be. Hence it would appear that there is really and truly no necessity for a retired Director of the Indian Geological Survey to be connected with the India Office to act as a Geological Adviser to the Secretary of State, as the true function of the advisers seems to be to see *which of the candidates are the best qualified, that is, simply and solely from a scientific point of view*. But as this is a function that can be discharged as well by a retired member of the Indian Geological Survey, who may have spent 20 or 25 years in India, as by an English Geologist who has never been out to India, it may be asked, What objection can there be to a retired member of the Indian Survey acting as one of the Secretary of State's advisers?

From an Indian point of view there seems some fair ground for objection, and it is this. It is a fact—and it is no use blinking it—that a large number of the Anglo-Indian officials, that is, who have been for some time in this country, acquire a certain bias against the Natives of India. (I am not concerned with its origin, that is, if it is only his insular prejudice simply intensified in the case of India, but the fact is there before us.) Thus other things being equal (for the Geological Advisers would rarely have the chance of personally knowing any of the candidates before them, and would thus have to depend mostly on the testimonials or qualifications as attested by the degrees or diplomas produced by the several candidates), the chances are that should there be a Native of India as a candidate, the circumstance of his being a Native of India would consciously or unconsciously go against him with the Anglo-Indian Geological Adviser.

Hence, if the interests of Indian candidates are not to be altogether disregarded, no one connected with the Geological Survey of India should be selected to act as an adviser to the Secretary of State for India.

Sir Thomas Holland is one of the present Geological Advisers to the Secretary of State. From my personal knowledge of him, which has extended since the student days in the Royal College of Science, South Kensington, in the eighties, where we were together. I may, I think, state with confidence that as long as he continues in this capacity of Geological Adviser to the India Office there is very little chance of any Indian student, however brilliant his qualifications might be, getting into the Geological Survey. The recent case of an Indian M.Sc. of Manchester, who was told by Sir Thomas to be unfit for the Geological Survey of India by reason of his temperament, tends to confirm my belief and looks like an indication of what may be in store for future Indian applicants.

Should it therefore not be the intention that the entrance into the Geological Survey should be practically barred against the natives of India, it would be advisable to appoint, as Geological Advisers, men who are unconnected with the Indian Geological Survey and who may therefore be depended upon for their entire freedom from bias in favour or against anybody. Any British Geologists would serve the purpose, but as the Professors of Geology in London, Cambridge, Oxford, &c., might at times have pupils of their own

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amongst the candidates for employment, it were better if the advisers were quite unconnected with any of the teaching institutions. Men like Sir Archibald Geikie, or the President or the Secretary of the Geological Society of London, or Directors of English, Scotch, or Irish Surveys, for instance, would make ideal advisers; but if the services of such men are not available, any Professors of Geology either in London, Cambridge, Oxford or elsewhere might be chosen as advisers. Indian students, I might add, are not afraid to be judged on their merits. All that they ask is that they may be judged fairly and impartially.

The method of recruitment into the service hitherto in existence, viz., through nomination by the Secretary of State for India in London, means that for getting into the Survey one must be brought up in Great Britain, and not only so, he must also have influence enough in England to secure in the end a nomination from the Secretary of State; which are difficulties great enough to keep Indians almost altogether out of the Department, and this they in reality effect. Thus it is that though the Department has been in existence for about 57 years, there have been only three Indians to join it so far, viz., Mr. P. N. Bose, who retired a few years ago; myself, who am retiring this year, and Mr. Daru, who has but recently joined. Considering the difficulties of an education in England and the final difficulty in securing nomination at the hands of the Secretary of State, the chances of Indian boys entering the Survey cannot but be very slender indeed.

If it be desirable that with the spread of education in the country the entrance into the Geological Survey should be rendered a little freer for Indians by lessening to some extent the special disabilities under which they labour under the existing system, then it is necessary that the present method should be altered a little. My proposal is not to introduce any great or violent change. What I would propose is simply that the system of nomination be altered into that of competitive examination. At present, whenever there is any vacancy the Secretary of State invites applications by advertisement, I believe, and selects the number required, whether one or two or more, as the case may be, with the help of the Geological Advisers. Under the alteration proposed, the number of vacancies is to be freely advertised as now; only the selection is to depend upon test, theoretical or practical, or both by the Geological Advisers, the best among the qualified men being appointed by the Secretary of State. If Indians are to be benefited by this altered system, it would be essential that these Geological Advisers or Examiners should be persons unconnected with the Geological Survey of India.

The nomination system has many drawbacks, among which are private influences exerted from outside. If the system of examination be introduced, this will leave the authorities free from this vexatious outside private influence, a thing that, everybody will agree, is neither good nor desirable.

This system of admission by competitive examination would, if introduced, considerably lessen, I am sure, the difficulties which at present stand in the way of the Indian student. If he could feel that there was the free door of fair competitive examination before him, he would know that if he could thoroughly qualify himself there was the chance of success before him. This would undoubtedly encourage him greatly, and Geology will be studied by a larger number than is the case now.

The difficulties I have referred to as existing under the present method of nomination, that is, so far as Indians are concerned, are not imaginary. I will give an instance or two which will illustrate how exceedingly difficult it often is even to approach the India Office, to say nothing of securing a nomination.

When, after taking my degree, I approached, through my Professor, the Principal of the University, for a letter of introduction to a member of the India Council, this gentleman, who had been a Lieutenant-Governor in India and had also, if I remember correctly, served on the India Council himself, told me point-blank and without the slightest hesitation that I could not get

an appointment from the Secretary of State in London because I was born of Indian parents!

Another Indian student who had secured a Gilchrist scholarship for study in England was promised by the Lieutenant-Governor of his province an appointment on the Geological Survey should he succeed in properly qualifying himself in England. In due course he secured his London degree and did later on do also some practical work under one of the London Professors, but failed to get the appointment from the Secretary of State he had been looking forward to. How far the Lieutenant-Governor had been justified in promising an appointment in the beginning it is not for me to say. But having promised it, it was, I take it, his duty to have exerted his best influence with the Secretary of State to have his promise redeemed. Another case is that of an Indian graduate of Birmingham. Besides taking his M.Sc. in Mining he had got a first class in Geology in B.Sc.; but while more than one English graduate from the same University but who had passed out much about the same time with *lesser distinctions* have succeeded in getting appointed to the Geological Survey of India, the application of the Indian graduate met with no success. Another very recent case is that of a Central Provinces man who, after taking his M.A. in Physics and working two or three years with the Geological Survey of India, went over to England with a Government scholarship. He studied under Sir Thomas Holland himself, who is the Professor of Geology at Manchester, and secured his M.Sc. degree very creditably, so far as I know; yet he found it impossible to approach the Secretary of State for an appointment.

My belief is that if there were an open competitive examination for entrance into the Geological Survey, these young men stood a good chance of success. At any rate, even if they did not succeed, they would have known that it was their own deficiency and nothing else to blame, and there would in consequence have been no heart-burning. But as it is they are bound to smart under a feeling akin to resentment against some body or system.

We have also to consider that Geology now forms a part of curricula of studies in the Calcutta, Madras, and Bombay Universities. These Universities are turning out graduates in Geology, and it seems but fair that the best among these graduates at least should have a chance of getting into the Survey, that is, not as Museum Assistants, Fossil Collectors, or Sub-Assistants, but as graded officers of the Department. If the Indian graduates could look forward to thus entering the Department, it would not require a prophet to predict that this would serve as a great stimulus and encourage them to put forth their best efforts in the pursuit of the science. I would therefore suggest some such plan as this:—Let, every three or four years, the most brilliant man among the graduates in Geology here be chosen, and chosen most impartially; let him have one of the scholarships (or like one of those) that the Government of India periodically provides for Mining and other studies in England; provided with this scholarship he will go to England for two years and work in London, Cambridge or elsewhere at one of the Colleges, but devoting not less than three months each year to field work with the Geological Survey of England, Scotland, or Ireland, and return at the end of these two years to India to join the Geological Survey, getting his appointment from the Secretary of State. At present the first two years of service on the Geological Survey of India are regarded as probationary. So the Indian graduate who would thus spend his two years in England may practically be regarded as having served his probationary period there. And should the selection be made thoroughly impartially and with care, there is no reason to fear but that he will turn out a success. But should a man occasionally prove finally disappointing, he need not be taken on the Survey.

I would propose this arrangement so long as the present method of recruitment by nomination continues. Should the system of competitive examination be introduced, the Indian graduate will then, of course, take his chance of success at the end of his two years,

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course in England with the rest of the candidates for appointment.

The teaching of Geology at the Madras, Bombay, and Calcutta Universities is now all in the hands of the Geological Survey of India, a member of the Survey being deputed for the time being to undertake the work. In Calcutta, especially, this connection of the Geological Survey with the Geological classes of the Presidency College has been close and long. For ever since they were instituted, that is, nearly 25 years ago, these classes have all along been conducted by some one member or other of the Survey. Sir Thomas Holland was, I think, the first Lecturer, and Mr. Vredenburg has been long connected with the work. So the training that the young men attending the Geological classes at the Presidency College here have been receiving must have been thorough and sound. Hence we cannot but be confident that the best of the graduates from India will, with a little further training in England, as a finishing touch, turn out perfectly competent for service on the Geological Survey as graded officers.

Should anybody be disposed to be sceptical and say that these Indian graduates do not possess a sound mastery of their subject and that their degrees are not worth much, then just imagine what this amounts to. You offer to train up a young man yourselves in a certain subject; he takes it up, studies it for years and takes his degree. Then at the last you tell him he is not worth his salt! He might have gone in for some other subject and made a career for himself but for your invitation. But now he has ruined himself, being now "neither fish, flesh, nor good red herring." As such a procedure would, I am sure, be nothing short of criminal, we will refuse even to contemplate such an alternative and must take it for granted that his training has been satisfactory and sound; otherwise the classes should have been abolished in all honesty. Should the Indian graduate discover any deficiency, it will get rectified as he pursues his scientific work on the Survey.

With regard to the recruitment of graded officers of the Department from the Sub-Assistant class.—In order to train up and utilise Indian youths for service on the Geological Survey, two Indians were first appointed in 1872 on the Survey, as an experimental measure, forming a class by themselves and being styled Sub-Assistants. They generally work under the supervision of the graded officers of the Department.

The present two Sub-Assistants form the second batch of the experiment.

From the reports of their work by their superior officers they would seem to be doing good work.

Year by year we are having increasing numbers of graduates of Geology turned out by the Universities in India. So in order that the Department might make greater use of the indigenous material that is coming out of the Indian Universities, and to make the service attractive, I would suggest—

(i) That the number of Sub-Assistants should for the present be increased to six, the scale of pay being somewhat on the following lines: Rs. 200—15—350, Rs. 350—25—700. The present scale of pay of the Sub-Assistants was fixed about 40 years ago, when there was no provision for the teaching of Geology in India. The first batch of Sub-Assistants were paid during the first five years of their service for being trained to do the elementary work of the Geological Survey. Since then the cost of living has more than doubled, and all Departments of the Government of India have been reorganised and the salaries improved to meet the increased cost of living. The scale of pay of the Sub-Assistants now stands lower than that of the previous incumbents, although a better type of men are now available. Hence the necessity for a substantial increase and the scale of pay recommended, viz., Rs. 200—(15)—(25)—700. These figures are lower than the scale of salary of men employed in other Government Departments and discharging duties equivalent to those of the Sub-Assistants of the Geological Survey of India, although, in most cases, service in other Departments does not entail the expense and

hardship of their being separated from their families during considerable periods.

(ii) That Sub-Assistants of five years' standing should be held eligible as candidates for vacancies in the grade of Assistant Superintendents; and that should the Director of the Department regard a particular Sub-Assistant as having exceptional merits, he may recommend to the Secretary of State that the Sub-Assistant in question may be appointed to fill a vacancy about to occur.

(iii) That the Sub-Assistant selected for promotion may be asked to prosecute a course of higher Geological studies or research for two years in Europe.

80,493. (IV.) Conditions of Salary.—Prior to 1906 the officers of the Department were graded, with a scale of monthly salaries, as follows:—

Director - - - -	Rs. 1,500-60-1,800
Superintendents - -	Rs. 700-50-1,100
Deputy Superintendents -	Rs. 500-40-700
Assistant Superintendents	Rs. 350-30-500

On reorganisation of the Department in 1906 the salaries were raised as thus:—

Director - - -	Rs. 2,000.
Superintendents -	Rs. 1,000-80-1,400.
Assistant Superintendents -	{ Rs. 350-30-500 for 1st five years. Rs. 500-50-1,000 thereafter.

On grounds, among others, that those members that have joined the Department since 1907 are not allowed compensation allowance, that Calcutta is one of the "most expensive places in the world," that duties of the Survey entail great physical combined with strenuous mental exertion, that the prospects of promotion to the Superintendent's grade are small and that they are not allowed private practice, the majority of the present members of the Survey now ask that their salaries may be raised still further, viz. :—

	Existing Pay (Monthly).	Pay asked for (Monthly).
Director - - -	Rs. 2,000	Rs. 3,000
Superintendents	1,000-80-1,400	1,500-100-2,000
Assistant Superintendents -	{ 350-30-500 500-50-1,500	500-50-1,500

Comparing now the maximum monthly salaries of the Directors of the Geological Surveys of India, United Kingdom, United States and Canada, the table stands thus:—

	Rs.
Director, Geological Survey, India - - -	2,000
" " " United Kingdom - - -	1,250
" " " United States of America - - -	about 1,500
" " " Canada (not more than Rs. 1,000—so far as my information goes).	

Looked at in detail the scales of pay of the members of the Geological Survey, United Kingdom, and of those of the Indian Survey are:—

United Kingdom.	
	Maximum Monthly Pay. Rs.
Director - - - -	1,250
Assistants to Director - - -	937-8-0
District Geologists - - -	750-0-0
Geologists - - - -	375 or 500
India.	
Director - - - -	2,000
Superintendents - - -	1,400
Assistant Superintendents -	1,000

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Thus the existing rates of the salaries of the members of the Geological Survey of India are seen to be a good deal higher, in fact nearly double, those of the members of the Geological Survey of the United Kingdom. This higher Indian scale is, of course, justified on the ground of India being the "land of exile" and "regrets."

But the prayer of the present members of the Indian Survey is for a still further rise, and, if granted, the rates compared with those of the United Kingdom will stand thus:—

<i>United Kingdom.</i>	
	Rs.
Director - - - - -	1,250
Assistants to Director - - - - -	937—8—0
District Geologists - - - - -	750
Geologists - - - - -	375 or 500

<i>India.</i>		
—	Existing Pay.	Pay asked for.
	Rs.	Rs.
Director - - - - -	2,000	3,000
Superintendents - - - - -	1,400	2,000
Assistant Superintendents	1,000	1,500

The increase asked for certainly seems high. Considering, however, the importance of the post, the Director's pay might be somewhat increased, but the increases of pay from Rs. 1,000 to Rs. 1,500 for the Assistant Superintendents and from Rs. 1,400 to Rs. 2,000 for the Superintendents do not seem called for. India is no longer the golden pagoda tree she used to be; if she could afford to pay higher salaries to her Geologists, there would of course be no objection. But evidently she cannot afford it. Famine and pestilence, from which India is now never free, attest to her condition of penury and destitution. And in this state she cannot really afford the luxury of such very high salaries for her Geologists. She has to cut her coat according to her cloth, and must fix her payments according to the state of her exchequer. She is, I presume, quite content with the present qualifications of the staff of the Survey and with the kind of work that is being turned out by them.

It might be urged that unless the present salaries were increased the members of the Survey might prematurely leave the Service. If they find that they can do better elsewhere they will of course go; and when such resignations or early retirements begin to occur, it would be time enough to consider the matter. But so far there does not seem any reason to apprehend any such danger. Of the men who have resigned or retired early within the last few years, Mr. Oldham left because of supersession; Dr. Walker because of his success in securing a professorship in his native land, and Mr. Smith owing to ill-health. The cause of Sir Thomas Holland's retirement was, I believe, his success in securing a professorship in his own country. The reason why Messrs. Maclaren and Lake went was, I think, disagreement with the Director and ill-health, respectively. Of these men who thus left early, Sir Thomas Holland and Dr. Walker have got professorships in their native lands. We have not heard what eminence the others may have attained to. So we might, I think, fairly conclude that the existing rates of pay on the Geological Survey of India are not altogether unattractive, especially when we remember that the Indian scale of pay is actually so much higher than that of either United Kingdom or United States of America, the two richest countries in the world and where geologists generally possess a world-wide reputation.

With regard to the increase in the number of the Superintendents. If the qualifications of the Assistant Superintendents are really so high as they are stated to be, and this is advanced as one of the reasons for an increase of pay, then it would seem unnecessary to divide the Assistant Superintendents into so many field parties and to detail a Superintendent to regularly

supervise the work of the different parties. A Superintendent need ordinarily only supervise an Assistant Superintendent's work when the work is of an exceptional complexity, or where there is ground for dispute. That is to say, if it is maintained that constant supervision of an Assistant Superintendent's work would be required, that would mean that the Assistant Superintendents are not really so highly qualified as they claim to be, and thus the main ground for a rise in their pay falls through; while, on the other hand, if they are really so highly qualified as they are stated to be, then constant supervision of their work would not be needed, and in that case an increase in the number of Superintendents would be uncalled for and unnecessary.

Since Sir Thomas Holland's régime it has come to be the practice to retain one of the Superintendents at headquarters in order that he might take charge of the office. This seems to be rather a waste of the knowledge and experience of a Superintendent. For the charge of the office might as well be undertaken by a senior Assistant Superintendent, as has actually been done on many occasions, and as is actually the case at the time of writing this, and with perfectly satisfactory results, I believe, leaving thus the services of all the three Superintendents to be fully utilised in the more important work of the Survey.

Thus everything considered there hardly seems any cogent reason for increasing the number of Superintendents from three to five.

The Geological Survey of India has neither a Petrologist nor a Palæontologist on it. It never had a Petrologist, and since Dr. Noetling left the Survey has had no Palæontologist. How a Geological Survey can get on without a Petrologist and a Palæontologist would be a puzzle to many. To the conundrum—"When is a Geological Survey not a Geological Survey?"—the answer might not inaptly be—"When it has neither a Palæontologist or Petrologist! I am not so sure whether a Chemist is a greater necessity than a Palæontologist or a Petrologist. Unless a Survey became a mere Mineral concern, it can hardly get on without its Palæontologist or Petrologist."

80,494. (VII.) Limitations in the employment of non-Europeans on the Geological Survey of India.—The term "non-Europeans" would, strictly speaking, include Canadians, Australians, &c. But what is evidently meant here by "non-Europeans" is Natives of India.

There are no rules in black and white limiting the number of Indians to be admitted to the Geological Survey. But though it is so, the difficulties of admission into the Survey already adverted to have served as an effectual bar so far as the Indians are concerned. The Survey has been in existence for 57 years, and during all this time there have been only three Indians to enter it. Considering the extreme smallness of the number and seeing that the history of the Service may be coming under a close examination with a view to revision or modification, and remembering also that witnesses may not be wanting who may be ready to testify that Indians are "not yet" fit for such highly scientific work as is required on the Survey, this very smallness of the number being perhaps adduced as evidence of this incapacity, it is not improbable that discussion may arise as to whether it is desirable at all to take any more Indians on the Survey's graded list. Under these circumstances it may not be out of place to briefly indicate how the three men, the only men to join the Department so far, may have actually done their work.

Before doing so it is difficult to avoid a passing reference to the repeated attacks upon the Natives of India by Mr. Medlicott during his Directorship of the Survey. Mr. P. N. Bose joined the Department in 1880 and was the first Indian to enter it. Mr. Medlicott's disparagement was not confined to Mr. Bose and his work alone, but was extended to the entire Bengali race, though he had had no experience of any other Bengali. But not content with this, Natives of India as well as those of the whole continent of Asia came in for his general condemnation. Mr. Medlicott pours forth his soul on the question of the employment of the Natives of India in his Annual Report for 1886

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(Records, Geological Survey of India, Vol. XX., pages 11-13). The remarks there are too long for quotation here, but it will amply repay perusal to anyone who has half an hour to spare for diversion. The subject of the employment of the Natives of India on the Survey seemed to have acted on Mr. Medicott as a red rag on a bull. It is, in fact, incredible to believe that the mind of a man who was the head of a Department that is professedly wholly scientific could be swayed to such an extraordinary extent by bigotry and prejudice. To give a solitary quotation: Mr. Medicott says, for instance, on page 3, Part I, Vol. XX. Records Geological Survey of India: "Dr. King reported upon Mr. Bose's work as still exhibiting the want of observation and study that had been found fault with in previous seasons; I may, however, add that since going to the field this season Dr. King has written less unfavourably of Mr. Bose. *I only hope he has not been beguiled.*" (The italics are mine.) It is strange how far a man may be blinded by prejudice. Mr. Medicott does not even seem to have perceived that such extreme exhibition of prejudice defeats the very ends he aims at and is oftener than not likely to discredit him with the higher authorities.

The remarks of Mr. Medicott, as recorded in the publications of the Geological Survey of India, bear out quite plainly his love for the Natives of India in general and those of Bengal in particular. But how deep-rooted his prejudice against the Bengalis—his pet aversion and *bête noire*—was would be shown by the following incident.

Once during a visit of Mr. Medicott's to Kurki he asked for and got the help of one of the students there in going over certain parts of the neighbouring country. The student—a young fellow of good physique and plenty of energy—took him over the ground, and Mr. Medicott was so pleased with the activity and energy of the young man that he told him that it was young men like him that he (Mr. Medicott) would like for his Survey (*i.e.*, the Geological Survey) and so on. Eventually Mr. Medicott happened to inquire into his name, but no sooner had he replied that it was "Chatterji," the effect was magical and instantaneous; for during the rest of the journey home he never said another single word to Chatterji! (Mr. Medicott knew that no other Indian except a Bengali could be a Chatterji.) I had the story from Mr. Chatterji himself, who rose to be an Extra Assistant Conservator of Forests. He was one of the most able officers in his Department, and would have made his mark under more favourable circumstances.

Coming now to the consideration of the three men—the only men to enter the Department during these 57 years—so that one might judge how these may have done their work, first comes the case of Mr. P. N. Bose. The Directors Mr. Bose served under were Messrs. Medicott, King and Griesbach and Sir Thomas Holland. The severe condemnation of Mr. Bose's work by Mr. Medicott is writ all too large in his Annual Reports and has already been adverted to. Dr. King, the next Director, often wrote highly of him, though from Mr. Griesbach Mr. Bose did not succeed in gaining approbation. The last Director he served under was Sir Thomas Holland. At the time Mr. Bose left the Department Sir Thomas recorded, in the Quarterly Notes, No. 3, ending 31st December 1903, and dated Calcutta, the 1st January 1904, that "Mr. Bose retired on 1st December after a service of over 23 years and has the satisfaction of knowing that in his last year's work he has put the country in possession of a piece of property which, without counting his other services, is sufficient to balance his total expense to Government." In these days when one of the main objects, if not indeed the main object, of the Indian Geological Survey is the discovery and development of mineral resources of the country, such testimony from such a mineral expert as Sir Thomas Holland is a certificate indeed in favour of Mr. Bose, a certificate clearly testifying to Mr. Bose's having been a success and not a failure on the Survey.

If Sir Thomas Holland's verdict is to be accepted, Mr. Medicott's condemnation of Mr. Bose must have been unmerited and undeserved.

It may be added that though the Geological Survey and the Government of India failed to appreciate Mr. Bose's work, the public did not, for as soon as he retired he began to earn by private work, if Sir Thomas Holland is to be believed, an income greater than that of the Director.

As for Mr. Darn, his appointment is, it seems to me too recent for passing final judgment on him.

There remains then my own case alone. But supposing my case to have been a failure, would it be fair to generalise that all Indians are unfit? Among the total number of the English, Scotch, Irish, Germans, Austrians and others that have been on the Survey, surely they have not been all successes, but there have been some failures? Among so many men from Europe and America (we have had one or two from Canada) there are bound to have been some failures; and it would not justify one to conclude that because certain Englishmen did not prove successful on the Survey, as has several times happened, others of that nationality are likely to prove unfit for it. Similarly, admitting that I have not proved a success, would it be fair to generalise that all Natives of India are likely to prove failures? Referring to my own case, Mr. R. D. Oldham, then a Deputy Superintendent in the Department, with whom I spent the first field season after joining the Department, reported me, at the end of the season's work, as "physically, morally and intellectually" unfit ("spiritually" was left out, but perhaps through oversight). Dr. King was the Director when I joined, and he had no adverse report to make against me (except what he had written based on Mr. Oldham's report at the end of my first season) during his incumbency. Yet I could never make out why I was superseded by my junior in the filling up of the vacancy in the Deputy Superintendent's grade that arose in consequence of Dr. King's retirement, although the incoming Director (Mr. Griesbach) had sent up my name for promotion, I happening to be the Senior Assistant Superintendent at the time. (That my joining the Department was not to his taste might appear from almost the first words Dr. King said to me on my reporting myself to him on my arrival in Calcutta, *viz.*, "Why didn't you join the Education Department?" No doubt he said this in jest, but he seemed very earnest in his jest, and probably echoed the general opposition to the appointment of Indians on the Survey.)

As for Mr. Griesbach, the next Director, I had all along had the good fortune to earn his entire approbation during the first years of his Directorship, *i.e.*, till 1902 or 1903, that is, until differences of opinion arose between Mr. LaTouche and myself about our Northern Shan States work. When, therefore, during my furlough to Europe in 1897, I called at the India Office and was told by Sir Charles Bernard that Mr. Griesbach (who was also in Europe at the time) had reported that I had not been proving satisfactory on the Survey, I need not say that I was taken completely by surprise at this news. For so far as I know there was not a bit of work I had done up till then that had not met with Mr. Griesbach's approval. So my surprise and astonishment was naturally great to hear from Sir Charles of such wholly unexpected report of my work by Mr. Griesbach. (I am sorry to have to say anything against one who is dead, but I am sure I am doing no injustice to Mr. Griesbach's memory as I am stating the simple truth.) The next Director I served under was Sir Thomas Holland. I must say I had rather a stirring time under him, and could relate many an experience, but will content myself with one or two only.

While Mr. Griesbach was still Director and Mr. (now Sir Thomas) Holland was a Deputy Superintendent like myself, and before, therefore, he could really be in a position to competently pass any opinion about my work, he met Mr. Griesbach one day in one of the passages in the Geological Survey Library, near which I was working, and said that both of us, meaning Mr. P. N. Bose and myself, were "no good." I was working at my table and could not help overhearing their talk; but I must say in justice to Mr. Griesbach's

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memory that he (Mr. Griesbach) defended me against Mr. Holland's charge.

Soon after Mr. (now Sir Thomas) Holland became Director there was more than one vacancy in the Superintendent's grade, and as I had officiated several times in that grade, and found that, even after some months, no steps had been taken by the Director to have them filled, I went up one day to speak to him about the vacancy, when Sir Thomas not only said he was not going to recommend me for it (only he expressed himself in much more forcible language), but he told me, among other things, that he was going to report my "blunders" to the Government of India.

But when I mentioned in reply that if he reported my blunders he would, I hoped, report the mistakes that others also might have made in that connection, he said he would do in that respect just as he pleased. Evidently what he said was meant seriously. For, no sooner had the fossils been despatched to Europe, the Survey Artist at the time (Mr. Garrick) was ordered by Sir Thomas to prepare a small map of the portion of the Northern Shan States under controversy, I being asked to help to correctly place the most important localities. So everything was kept ready against the arrival of information from Mr. La Touche in Europe. But when Mr. La Touche's letter arrived, and it was found that I was correct after all, Sir Thomas declared to me that the matter possessed only an academic and secondary interest, and was thus of little importance. After this, no one saw anything more of that Shan States map prepared by the Survey Artist, nor did we hear anything more of the Shan States "blunders." Nor did Sir Thomas ever say in the publications of the Department a word about my views having been right, though he had threatened to report my case to the Government of India, having fully expected that I should prove wrong in my views. Evidently his object in thus intending to report my "blunders" to the Government was to strengthen his case to have me superseded. But though Sir Thomas had no mistakes of mine to report to the Government he ultimately gained his end, and I was superseded, and superseded I have remained.

Everybody knows what stigma attaches to stoppage of promotion. And I should not be surprised if this very stoppage of my promotion were adduced now as evidence to prove that I have been a failure on the Survey. Mr. P. N. Bose was still a Deputy Superintendent when he retired, after more than 23 years' service. Thus to the outside public the fact that none of us, neither Mr. Bose nor myself, could get into the Superintendent's grade, cannot but have a condemnatory significance.

Perhaps I have been a failure. But what I would submit is that because I may not have been a success, it would not be just, fair, or logical to arrive at the conclusion that all Indians will be failures on the Geological Survey, and are thus unfit to serve on it.

Personal matters are always unpleasant, and besides I have nothing to gain by recalling these experiences, especially as I am retiring immediately. My only object in stating them is that should men of such note as the late Director of the Geological Survey be found giving evidence testifying to the unfitness of the Indians for service in the graded list of the Geological Survey of India, it may be remembered that bias will often warp the judgment of even the cleverest of our men, that their statements may not therefore be taken literally, but received with reservation, and that the cause of the Natives of India may not suffer.

80,495. (IX.) Other points: on the Indian Employés in the Public Services Generally. — Another matter that it seems desirable should be drawn attention to is about the Indian employés generally in the service of the State, and it is this. It is a strange fact, but true, that there is a general complaint as to a proper want of appreciation of the work done by the Natives of India by their superior English officers. When an Indian colleague or subordinate has done some good work, the tendency on the part of the higher officials is either to belittle it or ignore it altogether. There seems a want of that spirit of generosity which gladly recognises

and welcomes the goodness of a piece of work, done by whomsoever it may be. And this want of generosity of spirit seems hardly consistent with that "British spirit" of which we are hearing so much just now, and which should, one would expect, characterise the "best Civil Service in the world" that India enjoys. How to account for it is a problem not for the layman, but for the statesman; but that it exists would appear to be beyond doubt from the universality of the complaint. The complaint that the work of an Indian does not generally meet with proper recognition is so general that it seems a duty to draw attention to it.

As a bare statement that the thing exists will not be considered sufficient, I will here refer to a few instances from my own experience in illustration. (The following refers to the work done in the Northern Shan States, Burma, a few years back.)

(i) The Devonian beds were first discovered by me. These beds were pronounced at the time by Mr. T. D. LaTouche, then Superintendent in the Department, as Upper Silurian, but were admitted by him to be Devonian the next season.

(ii) I also discovered beds of carboniferous age in the Tawnghtek beds in the Northern Shan States during the season 1900-01.

I noticed this discovery in my Progress Reports for the year, and again for the years 1901-02 and 1902-03. But it was not until March 1905 that the Department recognised the existence of carboniferous beds at all in the Northern Shan States, but even then the credit of the discovery of these beds was not ascribed to me, but to someone else.

(iii) Mesozoic rocks were first recognised and reported by me in the Kyaukkyan beds in 1899-1900; these same beds having during the same season been reported as Devonian by Mr. LaTouche.

The Napeng beds, discovered and described by me as Mesozoic during 1900-01, have since been the subject of a Memoir, being Memoir No. 4, Volume II., New Series, Palæontologia Indica (1908), by Miss Maud Healy, of Oxford, who agrees with me in regarding them as Mesozoic.

(iv) The Hsipaw beds reported as Upper Mesozoic (Cretaceous) or even Tertiary by me, but as Devonian by Mr. LaTouche, during 1899-1900, were regarded by the Director (Mr. Griesbach) as probably Jurassic in 1901-02 and as Upper Jurassic or Lower Cretaceous in 1901-02, and noted simply as Jurassic by Sir Thomas Holland in 1903, the Jurassics being included in the Mesozoics, while the Devonians lie outside the Mesozoics and form part of the Palæozoic rocks, which means a very great difference in age. Thus here also my views were confirmed both by Mr. Griesbach and Sir Thomas Holland.

A Memoir, written by Miss Maud Healy, of Oxford, on the Napeng beds in the Northern Shan States, has recently been published as a volume of the Palæontologia Indica. These beds were first named and described by me, and ascribed a Mesozoic age by me in 1900-01. Miss Healy's Memoir, just referred to, establishes finally that the Napeng beds are Mesozoic—the view held by me from the beginning. Miss Healy has also been good enough, from the fossils discovered by me in this area, to establish a new genus, *Datta*, founding a new family *Dattidæ*, on it.

Further, when in 1904 the discovery of the Devonian beds in the Northern Shan States, Burma, in 1899-1900 was ascribed to Mr. LaTouche, and when I, in my letter No. 9, dated October 14, 1905, drew the attention of Sir Thomas Holland to the fact that the Devonian beds had in that year been really discovered by me, Sir Thomas did not condescend to acknowledge it.

When again, in 1905, Sir Thomas Holland announced the discovery of Middle *Productus* Limestone fossils in the Northern Shan States by Mr. LaTouche, without any mention of the fact that I had made the discovery of Carboniferous beds there and reported it as early as 1900-01, I drew Sir Thomas Holland's attention to this matter in my letter of 14th October 1905, and appealed to him to consider if it was quite fair thus altogether

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to ignore my work in this connection, Sir Thomas gave no reply.

It would therefore seem that work deserving some recognition at least had been done by me on all these occasions, but that it had been left unnoticed by Sir Thomas Holland.

When, however, a mistake was made by me with regard to a small outcrop of shales and in the colouring of some maps in 1903-04 (so far as I can recollect) the fact was not only at once officially communicated to me by Sir Thomas, but was also without any delay published in the Quarterly Notes No. 1 of 1905-06, dated 1st July 1905, and thus brought to the notice of the Government of India.

When this last point was brought to the notice of Sir Thomas Holland in my letter of 14th October 1905, and he was therein requested to consider whether it

was not hard on me to make rather a trivial point so prominent and to draw the attention of the Government of India to it, while no recognition had been given by him to my chief work in the Northern Shan States, Sir Thomas vouchsafed no reply.

The above instances will, I trust, show that while no recognition had been given to the principal work I had done in the Northern Shan States, either in the publications of the Survey or demi-officially or even verbally, by Sir Thomas Holland, he had no hesitation in bringing at once to the notice of the Government of India some trivial defects of mine in the Quarterly Notes of the Department as alluded to above. The work in the Northern Shan States had been hard and strenuous, and all that I apparently received as a result of my services there was broken health and supersession.

Mr. P. N. DATTA called and examined.

80,496. (*Lord Ronaldshay*.) The witness was Assistant Superintendent in the Geological Survey Department and had officiated several times as Superintendent. He had now retired.

80,497. At present Indians had not sufficient opportunities to enter the Service and a competitive test or examination should be substituted for the system now in vogue. There would be a sufficient number of candidates available when a vacancy occurred. This competitive test should be held by a board of men like Sir Archibald Geikie, President or Secretary of the Geological Society of London, the Directors of the Geological Surveys of England and Wales, Scotland, or Ireland, or failing these, any British Professors of Geology, unconnected with the Geological Survey of India. At present the head of the Geological Survey of Great Britain was one of the advisers to the Secretary of State, but he could exert little influence. He objected to an ex-member of the Service in India being on the Board as he might be prejudiced against Indian candidates. In fact the presence of the present ex-member of the Survey on the Board seemed to have recently served as a bar to the admission of Indians into the Service. He therefore saw great disadvantage in any member of the Department being connected with the selection of candidates in England.

80,498. Young Indians who had done well in Geology in India should be given a scholarship and sent to England, and the selection should be absolutely impartial.

80,499. Half a dozen men should be selected, and their testimonials examined to see whether they had gone through a course of post-graduate work or field work, and gave evidence of original scientific work. In that way it would be quite simple to pick out a man likely to do well in the Department. The selection might be made by the Director of the Geological Survey in India, but he would like the selection to be made as carefully and impartially as possible, as he had knowledge of instances where even in the case of appointments of Sub-Assistants to the Survey there could be little doubt that impartiality had not been observed. It being so in the case of the non-gazetted staff, that would make it all the more imperative that in the selection of candidates to be sent to England for the graded service there should be no chance of any favouritism or partiality, for an incompetent man chosen carelessly or otherwise would be cited as a further evidence of incapacity on the part of the Indians for the Geological Survey.

80,500. With regard to graduates, who could not go to England, they might be taken into the subordinate service, and after a certain number of years, the best amongst them should be sent to England and given a chance to get into the higher service. He would not have any alternative methods but adopt the two methods suggested in his written statement.

80,501. There was no need to increase the number of Superintendents, as senior Assistant Superintendents could be put in charge of field parties with satisfactory results, as was actually the case formerly. Former Deputy Superintendents (who would now be senior Assistant Superintendents) had often been in charge of field parties. Neither was it necessary to have a Superintendent in charge of the Office when the Director was away. When he retired in June last an Assistant Superintendent had been in charge of the Office for nearly a year and had been doing the work well, other Assistant Superintendents having also similarly served before him. He had never been in charge of the Office himself.*

80,502. Every geologist was a chemist, palaeontologist, and petrologist, but now that all the branches had become specialised it was necessary to have a whole-time officer for the work of the palaeontologist alone. His work in connection with the identification of fossils was very important, if the Department was to remain really a Geological Survey.

80,503. He did not think members of the Department should be allowed to take private practice, because, as Sir Thomas Holland had said, it would be exposing them to temptation. Being on the Government Survey gave a man a certain status, and his opinion would be sought much more than the opinion of anyone else, and an officer when approached might yield to the temptation of a large offer. Thus, though the privilege of private practice might be good for him, so far as his private purse was concerned, it would be bad for the Government.

80,504. (*Mr. Abdur Rahim*.) The reason why he put the selection of a scholar into the hands of the Director while objecting to anyone connected with the Survey Department being on the committee in England, was because there was no other Geological authority in India recognised by the Government, and nothing more satisfactory could be done in the present circumstances.

* The witness afterwards wrote that in stating before the Commission that he had never been in charge of the Office himself, there was a slip of memory on his part, for he had been in charge of the Office for some months in Mr. Griesbach's time.

The witness withdrew.

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Sir T. H. HOLLAND.

At the India Office, Thursday, 7th May 1914.

PRESENT:

THE RIGHT HON. THE LORD ISLINGTON, G.C.M.G., D.S.O. (*Chairman*).

The EARL of RONALDSHAY, M.P.
 Sir MURRAY HAMMICK, K.C.S.I., C.I.E.
 Sir THEODORE MORISON, K.C.I.E.
 Sir VALENTINE CHIROL.
 MAHADEV BHASKAR CHAUBAL, Esq., C.S.I.

ABDUR RAHIM, Esq.
 FRANK GEORGE SLY, Esq., C.S.I.
 HERBERT ALBERT LAURENS FISHER, Esq.
 JAMES RAMSAY MACDONALD, Esq., M.P.

M. S. D. BUTLER, Esq., C.V.O., C.I.E. } *Joint Secretaries.*
 R. R. SCOTT, Esq. }

Sir THOMAS H. HOLLAND,* K.C.I.E., D.S.C., F.R.S., Professor of Geology at the University of Manchester, called and examined.

80,505. (*Chairman*.) The witness was professor of geology at the university of Manchester, and was previously Director of the Geological Survey of India. He had been asked on four occasions since 1910 to assist in considering the qualifications of candidates for appointments to the geological survey of India. The number of candidates varied greatly and it was not possible to give an average. On the first occasion the committee were asked to select three, and on the three other occasions one. The applications were fairly large, but were narrowed down considerably on examination of the papers, and still more after a personal interview. On the first occasion there were 23 applicants; on the second something less; on the third the list numbered about 8 or 9; and on the fourth only the residue of the previous candidates was considered.

80,506. The vacancies were always advertised and notified by circular to all universities. Anyone could obtain a form of application from the India Office. There was no fee of any sort at any stage, and every candidate could be quite certain that his qualifications would be considered.

80,507. When the applications were received the witness went through the statements made by the candidates, which included information with regard to their school training, their college and university degrees, and their post-graduate scientific work, if any. Those statements were always accompanied by testimonials and by references for further confidential inquiry. In accordance with the information so obtained, either directly from the candidate or indirectly from those given as references, the candidates were divided into three classes: first, promising candidates obviously suitable for interviewing; secondly, promising candidates who might be held in reserve; and thirdly, obviously unsuitable candidates. To get into the first class it was necessary for a candidate to be under 25 years of age and to have a first class honours degree, or an otherwise good degree supplemented by research work, and in all cases satisfactory testimonials and references. A summary of the qualifications of each candidate was then made in explanation of the classification adopted, and was returned to the India Office, with the papers in detail, in order that the obviously eligible candidates might be invited to come up for an interview.

80,508. For the purpose of having an independent opinion, he had always suggested the co-operation of the director of the geological survey of Great Britain, and on three occasions Dr. Teall had undertaken that duty, and on the last occasion Dr. Strahan, the new director, had assisted.

80,509. For estimating the relative merits of the candidates selected for interview there had always been an oral examination in general geology, with a certain number of questions to cover each candidate's special line. If a candidate had done any research work he was asked to explain in what way precisely his work had affected the progress of geological science. During the interview each member of the committee recorded independently his marks in two columns, one indicating the purely geological knowledge revealed by the oral examination, and the other, the personal impression made by the candidate, *i.e.*, his ability to state his facts clearly and in order, the quality of his method of

reasoning, and his suitability in temperament and of character to undertake the responsibilities of an officer not continually under the direct control of a superior. The marks recorded in the two columns were added to the estimates already made from the preliminary examination of the candidate's papers. The three columns were then added together, and in accordance with the totals the candidates were arranged in order of merit. The reports were then sent to the secretary of the revenue and statistics department at the India Office, who satisfied himself by a further personal interview in the presence of the committee as to the suitability of the selections made.

80,510. On the only occasion on which Dr. Strahan had been associated with him all the candidates were rejected, as they were below the required standard in simple geological knowledge. They came into class No. 1 in the preliminary work, but failed in the oral examination. He did not know whether they had taken honours degrees, but they had on paper qualifications sufficient to warrant an interview. It was not possible to look on an honours degree as the only qualification.

89,511. No candidate was placed over another until the whole of the three stages, already described, had been gone through, and the committee was governed not by their impressions but entirely by the totals. On every occasion Dr. Teall and he had agreed about the first and second candidates. On one occasion they differed about the third and fourth, the witness having placed a candidate third whom Dr. Teall placed fourth. Dr. Teall's third candidate was rejected by the Medical Board, and witness's third (Dr. Teall's fourth) was selected, and that happened to be a statutory native of India.

80,512. Since the adoption of the present system of selection, every recruit appointed had been, without exception, reported on most favourably by the director of the geological survey. The system, of course, was practicable only for a small service. It was obviously preferable to a simple competitive examination in which only one phase of a candidate's qualifications could be tested. At the same time, the mechanical inclusion of marks obtained during the oral examination made one part of the system purely competitive. The results thus obtained were, however, controlled by giving marks for the full academic history of the candidate, the evidence of those who knew him personally, and the impressions of the Committee regarding his personal qualities. Neither of those constituents was taken singly; the total marks determined the order of merit.

80,513. There had been a small number of Indian candidates on each occasion that a vacancy was advertised. Most of them were technical scholars, who had taken their course of mining in the Birmingham University. Although none of them reached the standard of academic qualification in geology required for Class I., the apparently best qualified of them had been invited for interview. On the oral examination in each case the candidate had broken down. Most of the Indian candidates who had approached the standard of academic qualification required were also distinctly over the age-limit, although this was not so strictly drawn with regard to them, because the committee would naturally like to get an Indian candidate if a suitable one could be obtained. He had only come across one Indian scholar in England who could be

* This witness did not submit a written statement.

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[Continued.]

regarded as definitely up to the necessary standard, and he was already over the age-limit when he came to England. This gentleman had never been a candidate for the geological survey, but with his qualifications and training he ought to be able to obtain a far more remunerative employment in the mining world. He had nominated him for a post in India with an initial salary which was greater than that which he would have got as a member of the geological survey, but he feared from his letters that his over-anxious temperament might give him an exaggerated impression of the uncertainties of private employment, and he had recommended the Government of India to consider his qualifications for the present vacancy. From the technical and scientific point of view, the gentleman he referred to no doubt possessed the required standard of knowledge and ability, but he was now 31 years of age, and it would be difficult to fit him into the regular service.

80,514. Experience showed that in present circumstances it was difficult to obtain Indian candidates comparable in qualifications to those who made application in England. With a service so small as the geological survey it seemed inadvisable to make any artificial arrangement for securing the appointment of any specified proportion of Indians in the superior service. It was in the best interests of the country to appoint the most highly qualified recruits obtainable, regardless of nationality, and, although it would naturally give him personally a certain amount of additional pleasure to be able to nominate an Indian candidate, he was forced to accept the purely mechanical results of the system of valuation prescribed and found so far to be successful. The total number of appointments available in the geological survey was so small that no community could regard it as a grievance to be unrepresented.

80,515. So far as direct recruitment to the superior list was concerned, the only practicable way to secure qualified Indians was for the director of the geological survey to forward through the Government of India the names of any Indian students who attained the required academic standard. It would then be necessary to devise a scheme of test which would compare fairly the candidates in India with those in England. For example, the director of the geological survey might be required to make an estimate of the academic qualifications of each candidate with reference to the standard of a first class honours degree in England, and to assure himself by personal interview and by oral examination that the candidate would be a desirable colleague, and that he possessed a sufficiently high standard of geological knowledge. A certificate might then be sent to England, and the Secretary of State might then institute a purely competitive examination. The examination would, in this case, have to be conducted with the same papers both in India and in England, and the results would be judged by independent examiners appointed by the Secretary of State. In such a case it would be desirable to charge a fee for the examination, as was done in the case of the British survey, in order to cover the extra expense.

80,516. The only place in India where geology was being seriously taught was in Calcutta, and there only on theoretical lines. There was no doubt that the standard of teaching of geology in India could not at present be compared with that in England. But every now and then an Indian candidate would be discovered of exceptional ability, which would counterbalance the disadvantages of his training, and it would not be fair to prevent such a man from competing in the ordinary way for the geological survey. The system he had suggested would act rather as a filter. The candidate would not be allowed to appear until he had satisfied the director by oral examination that he was in every way a suitable candidate both in geological knowledge and in personal characteristics, and with a statement of that kind before the Secretary of State it seemed quite fair that a competitive examination should be held.

80,517. The only other system he could think of would be to allow for that particular year the Indian

candidate to be selected in India without consideration of candidates that might appear in England, but under that system the very best man in England might be missed. In every post in India the very best man was required, whether an Indian or an Englishman.

80,518. It was a dangerous thing to give a young man a Government scholarship on the understanding that he was going to obtain a certain appointment afterwards. It made it very difficult indeed to refuse an appointment, and it might be found that the candidate was unsuitable, and consequently there would be a discontented man. He thought the scholarship system had done a serious amount of harm. On the last occasion he had before him a candidate who had been sent to England with a scholarship of 150*l.* a year to go through a course of mining. At the end of that course he appeared as a candidate for the geological survey and for an inspectorship of mines. He failed hopelessly in the oral examination, and was not qualified to take a post of inspector of mines as he had never served underground, and did not hold a mine manager's certificate. This was a hard case. The State had tempted this young man with 150*l.* a year, and had thus seriously damaged his career. It was bad for the boy and expensive for the State, though the expense was a small matter comparatively.

80,519. It had always been his opinion that the subordinate service might advantageously be enlarged for the purpose of recruitment of Indians. He would like that enlargement to be effected slowly and in accordance with the results of experience.

80,520. In 1903-4 two assistants were appointed by him, and they had since proved to be unqualified successes. He had no idea to what extent they had developed as pure geologists, but he was perfectly sure that the Government had no more loyal and devoted officials, and he was certain that the director of geological survey had no more desirable and trustworthy colleagues. With the gradual enlargement of the class of sub-assistants it should be possible to obtain a small proportion suitable for promotion to the higher grade, and in such cases the nominations should be made by the director of the geological survey. He was not prepared to say that those nominees ought to be made to face a competitive examination. After a man has attained a certain degree of seniority and had specialised it might be unfair to put him into competition with a fresh student from the university. He would leave the method of selection to the director of geological survey who made the nomination, as he was quite sure the director knew his men, and that amongst those sub-assistants there would be a certain number who were extremely good at purely mechanical work in their own line, though possibly not quite suitable for promotion to the grade of officers.

80,521. He would make no rule as to length of service before promotion, nor would he suggest that the promoted man should go through any further course, but he should give the privilege of coming to England under the usual study leave rules.

80,522. He agreed that the salary of the department was inadequate, and that that had an influence upon the field of selection. A partial answer to that question could be obtained from a consideration of the quality of the recruits. It had been found that the Indian service did not attract men away from the home geological survey in spite of the lower pay in England. In the home service they began at 120*l.* a year and could rise to 1,000*l.* a year. In October of last year Mr. R. W. Palmer was appointed, and there were then two other candidates that he would readily also have accepted. Notice was soon afterwards given of a vacancy on the English survey, and in the following December, when another candidate was required for India, the two candidates preferred to face the competitive examination in England rather than accept the certainty of an appointment in India. The numbers were small and variable, but he had no doubt in his mind, and Dr. Teall told him that he had no doubt in his, that the home service, in spite of its lower pay, attracted on an average a better candidate than the Indian service.

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80,523. He could not say that if the scale of pay was increased in India the field of recruitment would be proportionally enlarged, as he was not sure that pay was the only cause. There was a certain prejudice against India, partly due to sheer ignorance, and partly due, possibly, to the unfair criticism nowadays in the House of Commons, which was the only time the public heard of Indian officials.

80,524. The witness's views with regard to the Indian scale of pay were put forward in 1905 in proposing a scheme of reorganisation, but the finance department failed to realise that the rates then proposed represented a minimum. Since his retirement from the service experience showed him that he had under-estimated rather than over-estimated the scale of payment required to secure suitable men. In the first place, he thought it was necessary to raise the initial pay from Rs. 350 to Rs. 500. Next to the initial pay, the pay of the director was the most important feature for consideration, and that he should fix at Rs. 3,000. The intermediate scale of pay was less important and might be made a little more elastic to meet the great variations in the rate of promotion that always marked a small department. Experience since 1905 showed the necessity of increasing the number of superintendents, as that was the highest grade that all except one of the best could hope to obtain, and the maximum pay of that grade he should fix somewhere about Rs. 2,000. For the increments and limits of the junior grade a scale could be drawn up in accordance with the experience of the past ten years and a margin might be provided to deal with hard cases due to possible bunching at the top of the list. The pension was an even more important question.

80,525. (*Sir Murray Hammick*.) It would be a serious mistake to permit officers to engage in general private practice. The demand would be for two or three officers only, and they would ordinarily be the best and their services would not always be available for the Government. No system of control could ensure an even distribution of private practice, as most cases would be suitable only for the officers with a special knowledge of mining and economic mineralogy. The remaining officers, whose work was purely scientific, but none the less important in the long run for the mineral development of the country, would never be employed by companies and accordingly would have a real grievance. To permit private practice would tend to encourage some officers to spend more energy in keeping their qualifications before the eyes of the public than in meeting the requirements of Government.

80,526. The present system of allowing an officer to take his pension after 20 years' service had the advantage that it enabled men to compete for professorships in England. These were generally filled before the candidate passed the age of 45. Thus a member of the geological survey of India would be eligible for a professorship in England after about 20 years' service, but would not be eligible if he stayed for another five years. The difference between the pension at 20 years' service and the full pension was 87*l.* a year, and obviously it would be very unwise for a first class geologist to forego the chance of earning 600*l.* to 1,000*l.* a year, with opportunity and time for private work in England, in order to wait for another 87*l.* a year. Therefore the 20 years' pension was obviously a great temptation for a good man to go. He should keep the 20 years' pension as at present. It was sometimes desirable that a man should be encouraged to go and it should not be made hard for him to do so. At the same time the maximum pension ought to be raised to about Rs. 7,000 and the superintendents ought to be granted an extra bonus of Rs. 1,000, which was now given to superintending engineers in the public works department. It had to be remembered that without luck as well as ability no officer could expect to pass the superintendent's grade.

80,527. The system of reorganisation that he drew up in 1905 made provision for a time-scale. The assistant superintendents should have a separate time-

scale, and promotion to the superintendents grade should be by selection.

80,528. (*Sir Valentine Chirol*.) It would be rare for some years to come for any very able Indian to qualify for appointment in India. He hoped that in time it would not be rare, but it would be many years before the educational opportunities for geology in India could in any way approach those in England, not because of the want of teaching but because of the natural advantages of England for learning geology.

80,529. His proposal was that, if the director of the geological survey in India could nominate a candidate from India, that candidate should go through a competitive examination. But if the director said he had a man in India with the requisite qualifications and in every way suitable, then, on his responsibility, and with the permission of the Government of India, that man could be appointed at once if he was good enough. The service wanted men who were good enough, not necessarily the high-flyers.

80,530. (*Mr. Abdur Rahim*.) Under the system of examination for the department in England candidates sent in their applications with full statements of their qualifications and testimonials, and the director of the geological survey nominated those whom he thought were fit to sit for a competitive examination. The director satisfied himself that the candidate was suitable, both as regarded geological knowledge and personality. He was not sure whether the candidate was interviewed, but testimonials were obtained and private inquiries made at the universities. There was no doubt that under that system very satisfactory men were obtained for the English survey. His own system with regard to candidates for India was approximately the same, except that he did not give the purely competitive part the same weight.

80,531. If Indian candidates came over to England to undergo a training and sat for the examination in England they would have exactly the same chance as any other candidates. He would not shut the door to any subject of the King. What he proposed was merely additional facilities for the Indian students who were unable to come to England to face the competition. He wished to give them an opportunity of having their qualifications considered in India. The director in India would apply the same process of selection as was applied in England, or a better process if he could think of one. The director of the geological survey in India knew every promising geological student in the country.

80,532. There were competent geologists in India outside the service whom private firms could consult. He had had two students under him, one of whom he had recommended to the education department for a lectureship. The other he had considered too good for Government service and had offered him facilities for private work. The one in the educational department was probably now getting Rs. 250 a month, while the other, who had been completing an investigation for some friends to whom he recommended him, had been getting Rs. 1,500 a month and had retaining fees from other firms.

80,533. If Government officers were allowed to undertake private practice, scientific geology would suffer, amongst other ways, in that firms would not put their information at the disposal of the Geological Survey Department. They would be afraid that the officers who had access to their information might be employed by a competing company. In the present circumstances any company in India would place at the disposal of the director all the information it had at its disposal.

80,534. (*Mr. Macdonald*.) He doubted whether the impetus to the study of geology at Calcutta and other places in India would be appreciable if the director was allowed to nominate men in India for appointments to the department. The impetus would come more from the enlargement of the subordinate service, because a larger number of men would certainly qualify for that. The real impetus came from the development of the mineral industries of India as a whole and the increased prevalence of private work. The department could only absorb a very small number of men, not

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[Continued.]

nearly enough to excite the ambitions of a big community.

80,535. The allurements of Government service had a greater influence on students in the universities and colleges in India than those of private practice, possibly because people were always willing to pay very heavily for a certainty.

80,536. The geological education in Calcutta was more theoretical than the average training in Great Britain, but it need not remain so if they continued the system he adopted when director of picking out the good men and training them in the geological survey. Arrangements were still made to bring certain selected students from Calcutta to parts of India where the field for study was better, but the excursions were quite short for demonstration purposes, and that could not possibly take the place of long-continued practical training. Nothing of that kind could replace the geological atmosphere of certain areas of the world, as, for example, England. It did, however, give students a first-hand acquaintance with field-work and geological survey. It was difficult to make comparison between the training in India and that at Oxford or Cambridge, because in England the students during their vacations spent a great deal of time in the field, and the field of course was accessible, whereas it was a long way from Calcutta to the nearest geological exposure, and that was only of one type. England happened to be a little geological museum in itself.

80,537. The same kind of work was being aimed at in Calcutta as in England and the same good teaching was being given, and as long as the professor was also a member of the geological survey the same good work would be carried on.

80,538. To a certain extent it was true to say that one of the reasons why the development had not been more marked was that there were not sufficient openings to give inducements to geological students. Men who went through a practical training in mining had a larger number of openings in India, but the geological students in Calcutta very rarely took up mining, as they had to work underground.

80,539. (Mr. Fisher.) He looked forward to an enlarged recruitment of the upper service from the subordinate service, but that would not be accompanied by any increase in the cadre of the other service. He should increase the subordinate service without altering the present number of the upper service. The greater the number of promotions from the subordinate service, the fewer posts recruited in England, but he could give no idea of the number of subordinates who would be appointed, because it was a matter that would have to be taken up gradually and as the result of experience.

It would be unwise in a small department to lay down rules as to numbers. The way in which a small department disturbed the budget was unimportant. That was one of the reasons why a big department had to have definite rules and numbers. In a small department more elasticity was required, both in numbers and the kinds of appointment.

80,540. During his time in India there had been only two men in the subordinate service fit for promotion to the higher service, and they had not passed the stage at which he could reasonably consider their promotion. As subordinates they were as perfect as any men he had met. Whether they had since developed a sufficient amount of geological knowledge and judgment to undertake the superior work he was not able to say at present.

80,541. (Mr. Sly.) Generally the geological student completed his university course and took his degree at the age of 22, and might get through a year of post-graduate work at 23 or 24. The candidates had usually been about 24 years of age, and the average age of appointment to the survey had been a little higher. He considered it desirable to retain the present age limit of 25 so long as the study leave rules were maintained. He was totally opposed as a rule to young men being appointed over the age of 25, because if a man was good enough for the service he had shown his qualities before that age. He could always be given study leave later to develop any special line for which he showed an aptitude. To send a scientific man out at a later age meant that his habits were fixed. He was not ready at a late age to submit to the requirements of discipline, and it was difficult to accommodate him to Indian conditions. The best results in the geological survey had been got from young men.

80,542. The English service was about the same size as the Indian service, but the annual requirements were probably a little less. He had never known three vacancies in the English service at once. When there was a vacancy there was an examination.

80,543. (Lord Ronaldshay.) He did not think that for the grade of sub-assistant the best products of the Indian geological schools would be obtained, and he hoped in time men would be turned out in India too good for sub-assistants. He did not regard promotion as a permanent method of recruiting Indians to the superior service, but only as one way of giving students an immediate opportunity.

80,544. (Sir Murray Hammick.) He had not considered any scheme for instituting geological courses in parts of India other than Calcutta, Madras, and Bombay.

The witness withdrew.

Note.

80,545-743. Attention is also invited to the evidence given by Mr. F. C. Drake, Secretary in the Revenue and Statistics Department of the India Office, on Monday, 4th May 1914. This will be found generally in paragraphs 66,679-66,719 in the section of Volume XV. relating to the Forest Service, and in particular in paragraph 66,695. Mr. Drake also put in the following statement with special reference to the Geological Survey of India Department:—

Statement to show the Number of Officers appointed by the Secretary of State to the Geological Survey of India Department from 1904 to 1914 (end of April) inclusive.

Year.	Europeans.	Indians.
1904	1	—
1905	4	—
1906	4	—
1907	1	1
1908	—	—
1909	—	—
1910	1	—
1911	2	—
1912	—	—
1913	1	—
1914	—	—
(to end of April)		
Total -	14	1

APPENDIX I.

LIST OF APPENDICES.

I.—STATEMENT of the CIVIL APPOINTMENTS on Rs. 200 a Month and over held by EUROPEANS, ANGLO-INDIANS, and INDIANS, on the 1st April 1913, in the GEOLOGICAL SURVEY OF INDIA.

II.—CONDITIONS for INDIAN GEOLOGICAL SURVEY APPOINTMENTS.

III.—OFFICIALS and NON-OFFICIALS who furnished WRITTEN EVIDENCE to the ROYAL COMMISSION in connection with their INQUIRY into the SURVEY OF INDIA DEPARTMENT, but who were not ORALLY EXAMINED.

APPENDIX I.

STATEMENT of the CIVIL APPOINTMENTS on Rs. 200 a Month and over held by EUROPEANS, ANGLO-INDIANS, and INDIANS, on the 1st April 1913, in the GEOLOGICAL SURVEY OF INDIA DEPARTMENT.

Pay.	Number of Employés in each Grade or Class.															
	Total.	Europeans.	Anglo-Indians.	Hindus (including Sikhs and Parsis).										Muhammadans.	Indian Christians.	Buddhists.
				Brahmans (including Shenvis).	Kshatryas.	Kiayasthas (including Farbhús).	Baniyas and Vaisiyas.	Sutras.	Other Hindus (i.e., other than those shown in cols. 5 to 9).	Total Hindus (cols. 5 to 10).	Sikhs.	Parsis.	Total Hindus, Sikhs, and Parsis (cols. 11 to 13).			
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.
Rs.																
200—300	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
300—400	2	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
400—500	2	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
500—600	3	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
600—700	4	3	—	—	—	—	1	—	—	—	—	—	—	—	—	—
700—800	3	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
800—900	2	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1,000—1,200	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—
1,200—1,400	2	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1,400—1,600	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2,000—2,500	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	22	19	—	—	—	1	—	—	1	2	—	—	2	—	1	—

APPENDIX II.

CONDITIONS for INDIAN GEOLOGICAL SURVEY APPOINTMENTS.

The Geological Survey Department is at present constituted as follows:—

Monthly Salary.

	Rs.	Rs.	Rs.
1 director	2,000		
3 superintendents	1,000	rising by 80 to 1,400	
15 assistant superintendents:—			
For the first five years	350	30	500
Thereafter	500	50	1,000
1 chemist	500	50	1,000

A local allowance of Rs. 150 per mensem is granted to the officer doing the work of palaeontologist at headquarters. The officer holding the appointment of museum curator receives special Presidency house-rent allowance of Rs. 150 per mensem.

No allowance of the nature of exchange compensation will be given.

2. Appointments to the Department are made by the Secretary of State for India. They will usually be made about July of each year, and the probable number of appointments will, if possible, be announced about two years in advance. The age of candidates should not exceed 25. Every candidate must be in sound bodily health, and will be required to satisfy the Medical Board at the India Office of his physical fitness in all respects to perform the duties of the Geological Survey, which involve considerable fatigue and exposure. It is desired to secure a candidate who is unmarried, and has not the intention of marrying within three years of his appointment.

3. Besides a good general education, a sound education in geology is essential; a university degree and a knowledge of French or German will be regarded

APPENDIX II. (continued).

as important qualifications, and certificates of a high moral character will be required.

4. Candidates must also have had one or two years' practical training in mines, or in technical laboratories, as may be required by the Government of India.

5. First appointments are probationary for two years, at the end of which time the probationer, if found qualified and continued in the Department, will reckon his service for leave and pension from the date of arrival in India.

6. A first class passage to India is given subject to the condition that its cost shall be refunded in the event of an officer resigning the service, on grounds other than certified ill-health, before the expiry of the period of probation. If, on the expiry of the period of probation, the officer's service is determined, or if he is compelled by certified ill-health to resign the service before such expiry, he will be provided with a free first-class passage back to England. Pay commences from date of arrival in India. Travelling allowances regulated by the rules applicable to the Department are allowed at a rate calculated to cover actual expenses of tentage and locomotion.

7. Under ordinary circumstances all assistants, unless they have special claims from previous training and experience elsewhere, will enter the Department in the lowest class, on a salary of Rs. 350 per mensem. This will increase annually at the rate of Rs. 30 per mensem for the first five years; thereafter at the rate of Rs. 50 per mensem, until the limit of pay for the grade, namely, Rs. 1,000 per mensem, is reached, the first increase to be from the date on which the assistant shall be declared to have passed the ordinary

examination in the language of the country by the first or lower standard, according to the general rules provided for such examinations.

8. This annual increase will in all cases be granted only on the certificate of the Head of the Department that the assistants so recommended have proved fully deserving of the promotion by the intelligence and zeal with which their duties have been performed.

9. Promotion to the grade of superintendent will depend on qualification and merit and on the existence of vacancies in that grade. In the case of an officer who joined the Department before the end of 1893, but not in the case of one who joined later, the following rule applies, viz., that he may, if specially qualified, count all service on the maximum pay of a grade towards increment in the salary of the next higher grade.

10. While local experience and training must always hold a very prominent place in estimating the position or the promotion of assistants, it must be distinctly understood that mere seniority of service, unaccompanied by proved ability and steady devotion to duty, gives no claim to promotion into the higher grades of the staff of the Survey.

11. The leave, leave allowances and pensions of officers of the Department will be governed by the provisions of the Civil Service Regulations applicable thereto. These regulations are liable to be modified by the Government of India from time to time.

India Office,
August 1913.

APPENDIX III.

OFFICIALS and NON-OFFICIALS who furnished WRITTEN EVIDENCE to the ROYAL COMMISSION
in connection with their INQUIRY into the GEOLOGICAL SURVEY OF INDIA
DEPARTMENT but who were not ORALLY EXAMINED.

1. N. D. Daru, Esq., Assistant Superintendent, Geological Survey of India.

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