

forms before my mind and I have come to the conclusion that Spengel's *Ch. ceylonica* is entirely different from *Ch. bahamensis*; and Schmarada's *Pt. tricollaris* is the adult specimen of *Ch. ceylonica*. In the paper which I am preparing for publication, I retain *Ch. ceylonica* as a distinct species in which case *Pt. tricollaris* should be treated as its synonym. The second species represented in our collection will be described as *Ch. krusadiensis*. I have assigned one of these forms to Spengel's species, *Ch. ceylonica*, purely on the presumptive basis that this might have been Spengel and Schmarada's forms, and yet it might happen that this species was not known to these authors.

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Balaenoptera indica, Blyth.

MR. McCANN'S note on the great Indian fin-whale published in *Current Science*¹ is interesting and obviously the writer is of opinion that this large whale deserves the rank of a separate species assigned to it by Blyth. Blanford² is not quite sure about the position of the great Indian whale, for he observes that "as already pointed out, this species is probably the same as the great northern fin-whale (*B. sibbaldi*).

Beddard³ writing on the distribution of *Balaenoptera* points out that there seem to be no substantial grounds for retaining such species as *B. indica*, *B. patachonica*, *B. schlegelii*, etc." Blyth⁴ relies on the comparative slenderness of the mandible of the Indian forms of the great fin-whale for elevating them to the rank of a distinct species: a specimen said to be 84 feet long, had a lower jaw measuring only 21 feet. Collett⁵ has mentioned that specimens of *B. sibbaldi*, measuring 80-90 feet long, have lower jaw bones two-ninths of the total length and for a specimen 90 feet long Collett gives 20 feet as the length of the mandibles. Mr. McCann's measurement of the mandible of the specimen recently stranded in Bombay is in accordance with the above figures. In the absence of definite knowledge of the other external and internal characteristics of the Indian forms, it is risky to maintain that they constitute distinct members separable from *B. sibbaldi*. The occurrence of these whales in the tropical seas during summer which, according to the migration theory, should be found in the colder latitudes at the time, is no doubt a strong point, but will not constitute a character for creating a separate species.

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The Silk Industry of Japan.

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MR. C. C. GHOSH'S monograph on the Silk Industry of Japan (Scientific Monograph No. 8 of the Imperial Council of Agricultural Research) is what a publication of this kind should be—a study by a competent sericulturist of the Silk Industry of the premier sericultural country of the world. Such a study is sure to have been conducted with insight, and with a mind keenly alert to educative value. The publication comes with dramatic fitness at a time when the Tariff Board enquiry has drawn attention to the importance of the Indian Silk Industry; and the grant of protection, albeit inadequate, for Indian Silk by the Government

of India has imposed on Silk-producing Provinces and States the duty of developing their sericulture in fulfilment of their implied promise to the Indian weaver and the Indian consumer.

The organisation in Japan has evolved as the result of a purposeful policy working towards a clearly conceived objective. Japanese sericulture is an important expression of Japanese patriotism, and nothing is more striking than the way in which the whole country, from the farmer to the Imperial family, has worked together for the

¹ *Curr. Sci.*, 1934, 3, 1.

² *Fauna of British India—Mammalia*, 1881-91, 568.

³ *A Book of Whales*, 159.

⁴ *Journ. As. Soc. Bengal*, 1859, 28, 488.

⁵ *Proc. Zool. Soc.*, 1886, 253 and *Fauna Brit. Ind. Mamm.*, 1888-91, 567.

improvement of Japan's most important industry.

In the silk-producing parts of India natural conditions are quite as favourable as in Japan to the growth of the industry. The present reviewer, speaking with intimate knowledge of Mysore, can say without fear of informed contradiction, that this State enjoys exceptional advantages in climate and economic environment, and offers a practically unlimited scope for the expansion of sericulture. This was the opinion also of Italian and Japanese experts who visited Mysore, and went over the silk-producing tracts, with an eye to business. In Mysore, the industry is essentially connected with welfare. To quote the memorandum submitted to the Tariff Board:

"The industry is of great economic importance to the State. In some form or other it provides employment to about two lakhs of families... nearly a sixth of the total population. In the rural economy sericulture plays a very important part... enabling the family to turn its waste time to account and earn a return which in many cases makes all the difference between a half-starved and hopeless life, and a self-respecting competence."

This can probably be said with equal truth of other parts of India. The Governments of silk-producing states and provinces could not do better than follow in the footsteps of Japan in regard to their Sericulture.

The most striking features of the Japanese organisation are its comprehensiveness of scope, and the manner in which the assistance of the State reaches out into its most minute ramifications providing here a framework, there a suggestion test or scrutiny, elsewhere a gesture or more substantial token of approval or recognition. This immanence, so to speak, of watchful solicitude is calculated to inspire the worker with confidence, and make him respond nobly. From the cultivation of mulberry onwards every process is being constantly watched, tested, improved and standardised with unflagging vigilance. The Government not only desires the maximum of industrial efficiency; it is most anxious to maintain the reputation of Japanese silk for quality in the world's markets. There is no doubt that the success of Japanese sericulture is due to sustained scientific research, the results of which are promptly transformed into industrial practice by an admirable organisation which reaches the farmers, and to a careful

study of markets made with a desire to supply them with acceptable goods. As Mr. Ghosh says:—

"The secret of Japan's success in foreign markets is (a) close and continued study of the requirements of these markets by special representatives, and (b) standardisation."

Of course, standardisation means careful supervision and scrutiny and a rigid enforcement of standards by conditioning house tests and what is even more effectual, by the enlightened public opinion within the industry itself.

In Japan, standardisation is possible in the aggregate, because it is possible in every section of the industry. There is a distinct organisation for each part, which is so developed as to afford scope for specialisation in that part. It is difficult to conceive of an arrangement more conducive to rapid practical progress. For instance, the preparation of mulberry grafts—for in Japan there is no promiscuous propagation from seeds and cuttings—is a specialised industry giving employment to about 200,000 workers. The admirably organised and controlled system of egg-manufacture supplies the huge requirements of the industry with disease-free hybrid eggs, carefully selected and crossed according to the needs of each locality. This system furnishes employment to 8,000 establishments of scientific workers.

The rearing is done under the supervision and guidance of experts engaged on a co-operative basis for the season, and this has called into being a class of people who have to develop practical usefulness to earn a living. Then there are organisations for stifling cocoons, selling them, and so on and so forth, till the cocoons get to the reeling establishments, small and great, ranging from a girl with a *charka* to filatures with thousands of basins and workers "In 1927, the reeling factories 83,568 in number employed 462,594 women and 33,335 men." In Japan it took 30 years to revolutionise reeling and raise it from a state not very unlike ours to its present world-renowned quality. About 90% of Japan's silk is now reeled in filatures.

Though the bulk of Japan's raw silk is exported, there is enough left to support a flourishing weaving industry. Japan has a considerable export in silk goods, thanks to the excellent organisation of weaving with the help of domestic looms and cheap electric power.

The monograph is so interesting and so packed with facts, that to quote is a temptation fraught with danger; but no apology is perhaps necessary for two short extracts on two matters of supreme importance to Indian sericulture—especially Mysore and Kollegal sericulture—namely, seed production and sale of cocoons. It is obvious that a defect in either will rob the farmer of the fruits of his labour.

In Japan "Rearers of silk-worms are prohibited by law from producing eggs for rearing. The Imperial Sericultural Experimental Station is engaged on testing silk-worms from all over the world, and selecting suitable ones for Japan. It recommended for rearing the F_1 crosses of certain races. These races are made available to the Prefectural Experimental Stations which test them forlocal conditions. The parent worms are reared in the Prefectural Experimental Stations and made available to licensed seed-producers for producing F_1 cross for the general rearer.....There are 8,000 licensed egg-producers, and more than 40,000 persons engaged in the sale of these eggs."

Perhaps the most notable achievement of the Sericultural Department in Mysore has been in this direction. Races of worms from all over the world have been tested, and crosses selected such as would result in

an increase of 40% in the return to the rearer. What is even more important is that the rearer, that most conservative member of a conservative race, has been educated to recognise and accept the improvement. But for want of sufficient grants from the Government, the industry has been denied anything like appreciable benefit from this great achievement.

Again in regard to sale of cocoons :

"The recent development is sale through co-operative drying societies. Government is encouraging and subsidising these in order to foster the trade in dried cocoons."

This is a measure well worthy of adoption in all parts of India, except Kashmir where silk is a state monopoly.

The monograph is so economical in words that further condensation would probably result in unintelligibility, and we shall, therefore, commend a study of the text itself to such of our readers as require more information than can be expected in a review. The high message of Japan to India is seriousness and a realisation that the human value of industrial research lies in the speedy incorporation of its results in industrial practice. Else, knowledge comes, but wisdom lingers. The example of Japan should teach us how knowledge and wisdom can march hand to hand to prosperity.

Research Notes.

A Cathode Ray Furnace.

THE cathode rays produced in a rarified medium by a high tension current heat up very strongly any body (anti-cathode) placed in their path. This has been used by different experimenters to realise very high temperatures. Crookes (1879) was the first to make use of such an arrangement to melt platinum. In a recent paper in *Bull. Soc. Chem. de France*, Feb. 1934, p. 262, M. F. Trombe has described with details another cathode ray furnace worked by a transformer 110 to 20,000 volts, and utilising a current of 100 m.a. at the high tension. It consists essentially of a quartz bulb of three litres capacity into which are ground the aluminium electrodes—cooled by a current of water—and the support for the anti-cathode. A plane window placed near the tungsten anti-cathode crucible makes it easy to observe and measure optically the

temperature realised. The apparatus is characterised by a regularity in functioning, and the temperature reaches to 2700°C. in 15 to 20 seconds.

M. A. G.

On a New Mass-Spectrograph.

IN the *Zeitschrift für Physik* (1934, 89, 786), J. Mattauich and R. Herzog describe a new form of mass-spectrograph and the advantages it possesses over the forms used by Aston and Dempster. The focussing method of Aston utilises the prism-like action of the deviating fields so that ions of different velocity but same mass come together to a focus, when the initial direction of all the rays is the same. In the method of Dempster the lens-like action of a magnetic field is used to focus ions of the same velocity but issuing in different directions so that they come together. Now R. Herzog has