here he enunciated the fundamentally new doctrine that energy is emitted in discrete amounts called quanta. He also showed that the quantum is proportional to the frequency, the constant of proportionality being the remarkable quantum of action, h, since famous as Planck's constant. The successive researches of Einstein (Theory of the photoelectric effect, 1905), Bohr (Theory of the hydrogen spectrum, 1913), Compton (1922), Raman (1928), Heisenberg (The Uncertainty Principle, 1927), have only proved how this constant pervades the whole of atomic physics. His part in these later researches was more that of the master rejoicing in the adventures of younger minds, constantly counselling them not to go astray, rather than that of active participation. But when some exaggerated speculations of a philosophical character were based on the uncertainty principle, Planck asserted his individual opinion and, together with Einstein, supported the principle of Causality. As a teacher he is well remembered for his text-books, particularly those on Heat and Thermodynamics, which have been translated into various languages.

The minute attention to detail exhibited in the enunciation of his radiation formula and the happy faculty of making a grand generalization shown in the theory developed to explain the formula were characteristic of his spirit. The presence of artistic ability thus indirectly exhibited was even more evident because of his musical talent, a characteristic common to many other great scientists including Einstein. A kind of religious spirit with which scientific investigations were carried out also contributed to the feeling of respect which he inspired in his scientific colleagues. In fact Prof. Planck himself has unconsciously revealed the essence of his spirit in some remarks he made about Sommerfeld on the occasion of the latter's seventieth birthday. We shall, therefore, close this expression of homage to a great soul by giving a translation of his sentiments regarding another great colleague. This is what he said :

> "But a careful observer cannot fail to notice that in Sommerfeld's genius there is, besides a dispassionate feeling for mathematical correctness and physical reality, another motive which has its origin in a remoter region and has an æsthetic basis and which is encountered in fertile geniuses of all ages from Pythogaras to Bohr : it is the incentive due to that mysterious harmony and completeness of the picture, which the ever forward-groping fancy of the investigator discloses when he tries to fit his thought to the data furnished by Nature. Those laws which, like those of the anomalous Zeeman Effect, have not yet been completely explained are essentially the ones calculated to incite such flights of genius."

T. S. SUBBARAYA.

FUTURE OF INDIAN SILK INDUSTRY

THE Silk Panel appointed by the Government of India holds the view that consolidation rather than expansion is the immediate need of the silk industry in India. It has recommended a five-year programme of stabilisation of the silk industry in India preliminary to a phase of expansion during the next two quinquennia.

Demand for silk generally and for filature silk especially being high in war time, there was then a considerable step-up in production under Government encouragement. Thus between 1939-40 and 1945-46 the number of filature basins rose from 1,291 to 4,639, and the area of mulberry cultivation rose from 30,000 to 78,000 acres in Mysore, from 5,720 to 18,026 acres in Madras and from 8,983 to 15,516 acres in Bengal.

But the Panel warns that if the industry thus developed by State assistance as part of war efforts is now left unsupported, it may collapse, and with it an important source of India's war strength.

Incidentally, the Panel has made a separate recommendation that Japanese silk entering India by way of reparations should not be allowed to undersell Indian silk.

The Panel has recommended consolidation and improvement of the present position of the industry along a number of lines. For the improvement of mulberry cultivation, it recommends the five-year sericultural programme adopted by the Government of Madras to other silk-producing regions, *viz.*, Kashmir, Mysore, Bengal, Bihar, Bombay and C.P. While pointing out the need for effective State control to ensure adequate supply of disease-free seeds, it foresees the need for 300 fully-equipped grainages, costing Rs. 20,000 each, to meet the total requirement of India, which will be about 12 crores of layings. To control silk-worm diseases, the Panel adds, there should be in each silk-producing region a special enactment as in Mysore.

ULTIMATE TARGET OF PRODUCTION

In order to have the charkhas replaced by the filatures, a change on which rests the hope of the silk industry in India, the Panel recommends the setting up of co-operative societies on lines suited to local circumstances. It also pleads for authoritative establishment of definite standards conforming to accepted international grading. It emphasises co-operation among the various silk-producing areas in the country and recommends the establishment of a Central Silk Board representing all silk interests.

In the next five years, says the Panel, 49,868 acres more or 1,62,500 acres in all will be under mulberry cultivation and this will increase to a total area of not more than 1,87,500 acres (excluding Kashmir) in the 3rd quinquennium. Including the increase of 50 per cent. in the production of silk in Kashmir, the Panel does not foresee all-India production to be more than 4 million lbs. per annum at the end of 15 years, the annual consumption being estimated at 15 million lbs.