

prevention is better than cure; and that while these industrial homes are indubitably powerful in preventing the formation of criminals, prisons, on the other hand, are just as indubitably powerful in carrying it on!

Evening High Schools have been worked in several American cities, but hardly with results lending much encouragement to increase. One would think, however, that the knowledge gained at elementary schools by the age of fourteen would lead to a wish for more on the part of many, to whom a library only could not supply it. But free libraries are a great power in the United States. Forty-nine new ones were opened in 1879, containing 86,779 volumes, making a total of 3842 public libraries of all classes. The correspondence with the Bureau of Education on the subject of public libraries far exceeds that on any other subject; academies standing next, and art and science standing curiously low for a country like America. Yet local feeling varies even on a favourite subject like free libraries, the large manufacturing town of Paterson being without one like so many populous English towns.

Like free libraries also, agricultural education is a department in which England, notwithstanding the height to which husbandry has been brought there, stands lower than in any other country.

One can hardly, nevertheless, read this Report without feeling that spite of our shortcomings the advantages are not all on the side of America. Our compactness, plentiful supply of thoroughly-trained teachers, and, we must add, higher sense of honour in political transactions, perhaps owing in part also to the close inspection to which the works of every man are subjected here, entitle us to feel how far better we are placed, as far as meeting educational requirements goes, than the thin and scattered families of the United States.

MALAYO-POLYNESIAN LINGUISTICS¹

THE learned authors have earned the thanks of linguistic students by issuing, in a separate form, this important contribution to a better knowledge of the Melanesian and Papuan languages, which was first published in the eighth volume of the *Philological Transactions* of the Royal Saxon Scientific Institute. It forms the first instalment of a series of papers intended to supplement the comprehensive and well-known treatise of H. C. von der Gabelentz, published at Leipzig in 1860 and 1873. To the languages dealt with in that work are now added two others: that of Mafór (Núfór), Geelvinck Bay, and a dialect current on the Astrolabe Bay Coast, North-East New Guinea, from materials supplied by Van Hasselt and Miklucho-Maclay respectively. To these notices are added the Papuan idioms spoken in the islands of Errúb and Maer, Torres Strait, and in Segaar Bay, near Cluer Gulf, South-West Coast of New Guinea, the former by Herr Grube, the latter from data supplied by H. Strausch to the *Zeitschrift für Ethnologie*, viii., pp. 405-18.

In the introduction, the question of the relations of the Papuan and Malayo-Polynesian linguistic groups is discussed at some length. It is satisfactory to find that the authors seem at last disposed entirely to abandon the views held by the elder von der Gabelentz regarding a possible, if not probable, fundamental unity of these families. The key-note of the objection to this theory is struck in the following paragraph, at p. 4:—"Assuming that the linguistic affinity were fully established, we should have at once a direct antagonism between anthropology and philology. Two linguistic groups are related; of the corresponding ethnical groups, one belongs to one, the other to another race of mankind. How is this possible?"

To many this may seem merely an old-fashioned

¹ "Beiträge zur Kenntniss der Melanesischen, Mikronesischen und Papuanischen Sprachen," von G. von der Gabelentz und A. B. Meyer. (Leipzig, 1882.)

a priori argument, of no value in itself unless supported by the evidence of facts, which have hitherto pointed at an opposite conclusion. But one of the most firmly established and universally accepted principles of anthropology maintains the evanescent character of human speech as compared with the relative fixity of physical types. Ethnologists are of accord as to the substantial unity of the Iranian, Semites, Berbers, Basques, Georgians, and other members of the so-called Caucasic ethnical stock. Philologists are, on the other hand, equally of accord as to the essential difference of the Iranic, Semitic, Hamitic, Basque, Georgian, and other linguistic groups spoken within this common Caucasic ethnical group. Here we have fundamental racial unity combined with organic divergence of speech, and the apparent contradiction is readily reconciled by the doctrine of the far greater permanence of physical, as compared with linguistic types. The race, even notwithstanding the intrusion of foreign elements, remains essentially one; the speech, presumably one originally, owing to its greater evanescence diverges in various directions to such an extent, that all traces of this original unity have long been effaced.

Coming now to the Oceanic area, where the Papuan and Malayo-Polynesian forms of speech, shown to be fundamentally one, while the physical forms are confessedly distinct, the case would be entirely reversed. Instead of physical unity, combined with linguistic disparity, we should have the opposite phenomenon of linguistic unity combined with physical disparity. Such a phenomenon is certainly neither intrinsically impossible nor altogether unknown to science, as appears, from the Persian-speaking Házéráhs and Aimaks of North Afghanistan, or the French and English-speaking negroes of the New World. But where they occur, such cases are easily accounted for by political supremacy, social contact, superior culture, and other obvious influences. These influences have also been to some extent at work probably for many ages in the oceanic world. The Malays in the west, and the brown Polynesians in the east, both of kindred speech, and both of roving or piratical habits, have in this way influenced numerous Papuan and Melanesian peoples in their respective domains. Hence we find the Tagalas, Bisayans, and even some of the Negrito Aetas of the Philippines, as well as some of the Negrito Samangs of the Malay Peninsula, and most of the Formosan wild tribes speaking various more or less divergent dialects of the organic Malay speech. In the same way the Papuan Motu tribe of the south-east coast of New Guinea, many of the Melanesian Fijians, New Hebrides, and Solomon Islanders are found to be now speaking various more or less divergent dialects of the organic Polynesian speech.

It was precisely from these misunderstood facts that philologists had generally arrived at the surprising conclusion that, in point of fact, the Polynesian and Melanesian languages were essentially one, thus placing anthropology and philology in antagonism. The Melanesian and Papuan dialects selected by Hans Conon von der Gabelentz, and again quite recently by the Rev. Mr. Codrington, as the subjects of comparison, were not, properly speaking, Melanesian languages at all, but Polynesian forms of speech imposed by the restless Samoans and other Polynesians on these Papuan and Melanesian populations. Obvious instances are the almost pure Papuan Motu people speaking a tolerably correct Samoan dialect (Rev. W. G. Lawes), and the mixed Melanesians of Fotuna, in the New Hebrides, speaking idioms closely related to the same group.

But it is remarkable that the reverse phenomenon has not yet been recorded. At least no instance is known to the writer of a distinctly Malay or Polynesian tribe speaking a distinctly Papuan or Melanesian tongue. It is more than doubtful whether such a case will ever be discovered in this watery domain, where the Malays and Polynesians

have always been the aggressors, where the dark populations have always represented the passive or recipient element. On the other hand, wherever it has escaped from Malayo-Polynesian influences, or wherever it has been able to preserve its original speech in spite of those influences, this dark element will certainly be found speaking languages organically distinct from the Malayo-Polynesian. Mr. Man's recently published account of the Andamanese dialects shows that they differ in their morphology, in their glottology—in fact, in every respect, from those of Malaysia.

Mr. Lawes makes the same remark respecting the Koiari people, who occupy the highlands back of Moresby Bay in South-East New Guinea. And the authors of the work under review now find that the Mafór of Geelvinck Bay betrays, with many striking resemblances to the Malayo-Polynesian, "an astounding peculiarity of structure."¹ The "resemblances" are of a verbal character, due to known contact with the Malays, who have long frequented the waters along the north-west coast of New Guinea. The "peculiarity of structure," involving root modifications and something even approaching to inflection ("Quasiflexion"), as understood in the Aryan family, belongs to the organic Papuan linguistic type. This type is thus demonstrated to be fundamentally distinct from the Malayo-Polynesian, which shows no trace of these peculiarities. And thus also disappears the fancied antagonism hitherto supposed to exist between the linguistic and anthropological elements in the Oceanic regions.

A. H. KEANE

THE SOLAR-COMMERCIAL CYCLE

IN an article printed in NATURE (vol. xix., pp. 588-90) I gave a table of the prices of wheat at Delhi, from 1763 to 1835, quoted, or rather calculated from data given in a brief paper of the Rev. Robert Everest, contained in the *Journal* of the (London) Statistical Society for 1843, vol. vi. pp. 246-8. Between the years 1763 and 1803 there was evidence of wonderful periodicity in the recurrent famine and abundance at that part of India. When recently engaged in examining more minutely the relation between these prices and the variations of solar activity, as indicated by Prof. Wolf's numbers, it has occurred to me that an inference may be drawn which I overlooked on the previous occasion.

In the accompanying diagram I have exhibited the prices in question together with Wolf's numbers as stated in the *Monthly Notices* of the Royal Ast. Soc. vol. xxi. pp. 77, 78. I have also indicated the dates of the Commercial Crises of the time according to the article on the subject in Mr. H. D. Macleod's "Dictionary of Political Economy," vol. i. pp. 627-8. It need hardly be said that the coincidence between the three classes of recurrent phenomena is of a very remarkable character, and goes far in supporting the relation of cause and effect which I had inferred to exist, both on empirical grounds and from the well-known fact that it is the cheapness of food in India, which to a great extent governs the export trade from England to India. But although the coincidence of commercial Crises in Western Europe with high corn prices at Delhi is almost perfect, it will be noticed that after 1790, the correspondence of the solar curve with that of prices is broken. Wolf does not recognise the existence of any sun-spot maximum between 1788 and 1804, and he believes that there was a minimum at 1798. According to Wolf's later researches (*Memoirs* Roy. Ast. Soc., vol. xliii. p. 302), these dates are respectively, maximum 1788·1, minimum 1798·3, and maximum, 1804·2.

But now arises the question to which I wish to draw attention. If the eleven-year solar periodicity was really interrupted in this long interval of 16·1 years, how comes

¹ "Cerade das Mafoor'sche aber wird in seinem Baue bei manchen auffälligen Aehnlichkeiten eine erstaunliche Eigenthümlichkeit im Bildungsprinzip aufweisen," p. 4.

it that the meteorological periodicity, as manifested in the corn prices at Delhi, was not interrupted. It is true that the price maximum of 1803 was a comparatively small one; but this was quite to be expected, considering that if there were an intervening solar maximum, it must have been a small one. May we not reverse the argument and infer that the evident relation between the previous sun-spot maxima and the succeeding scarcities at Delhi, would lead us to expect a minor solar maximum about the year 1797?

Standing alone, the presumption thus created would, doubtless, be of a somewhat slight character. But it is in the first place well known, that the data upon which Wolf based his numbers about this time, are less conclusive than in other parts of his series. His results, too, from 1801 to 1807 are expressly marked as doubtful, so that extrinsic information which might have little weight where there was abundance of reliable solar or magnetic observations may come in very usefully where doubts already exist. Now it happens that the late Mr. J. A. Broun inquired very carefully into the facts known about the solar variation at this time, his results being given in the *Transactions* of the Royal Society of Edinburgh, vol. xxvii. pp. 563-594, and in his article printed in NATURE (vol. xvi. pp. 62-64). Broun inferred from the observations of Gilpin, and from other data, that there was a small maximum about 1797, and that there were grounds for believing that the subsequent maximum "may really have occurred after 1806, when Gilpin's series terminated." Now, what Broun deduced from totally different data, is exactly what we should infer from the Delhi prices. If we are to believe that Indian meteorology depends upon solar variations, then it almost follows that there was a solar maximum about 1797. The consequence of this inference, however, is very important, because it goes to support the views of Lamont, Broun and others, that the solar period is about 10½ (10·45) years and not 11·1 as calculated by Wolf. It should also be pointed out that the temperature observations of Prof. Piazzi Smyth lead to a like result. The epochs of the heat waves are, according to him (NATURE, vol. xxi., p. 248), 1826·5, 1834·5, 1846·4, 1857·9, and 1868·8, giving an average interval of 10·57 years.

I may take this opportunity of asserting that the progress of events confirms belief in the eastern origin of the great commercial Crises.¹ In his important work, the "Précis du Cours d'Economie Politique" (vol. i. pp. 604-5), M. Cauwès while partially accepting the doctrine of periodicity criticises the particular views here advocated. He says:—

"Depuis longtemps les économistes ont signalé la périodicité de ces évolutions: MM. Juglar et Jevons prétendent même pouvoir la calculer d'une manière précise. Selon M. Jevons, l'ensemble des phénomènes serait renfermé dans un cycle de dix années et demie. De fait, les grandes crises économiques du siècle (1806, 1817, 1825-7, 1836-37, 1847, 1857), s'échelonnent à dix années d'intervalle ou à peu près, mais les dernières, 1866 et 1873, seraient venues un peu avant l'heure, et celle de 1873 s'est prolongée au delà de toute attente." M. Cauwès in short accepts the six earliest crises of this century as sufficiently agreeing with the theory. The crisis of 1866 no doubt came about a year before it would be expected, which is a divergence of reasonable amount. The year 1873, however, is one which it would be impossible to introduce into the series. Now there doubtless were both in America and England in that year, a state of commercial stringency, a relapse of prices and other disturbances which might be mistaken for the signs of a

¹ As it is impossible to reproduce the explanations and qualifications contained in the article quoted above, or that at pp. 33-37 of the same volume of NATURE (vol. xix.), it is assumed that this article is read subject to those qualifications and explanations. In p. 588 col. 6 of the same volume, a *seer* of wheat was by a typographical oversight stated to be equal to 21 lbs. instead of the true weight 2 lbs.