A number of measurements showing the amount of evaporation from the soil, or the amount of water left behind in different circumstances, have already been made, and Dr. Leather adds a further interesting series. Water determinations were made in samples taken to a depth of 7 feet from a plot of soil at Pusa during the dry season. The results are as follows:—

Lbs. of water per Cubic Foot of Soil.

Depth	Sept. 19	Oct. 20	Nov. 30	Jan. 8	Feb. 15	March 27	May 6	June 5	June 15
0–1 foot	18·97	15·78	14·21	12·15	12·10	14·18	10·83	13·87	10·41
1–2 feet	20·96	19·27	17·95	18·17	18·79	19·62	16·39	15·40	15·38
2–3 ,,	24·75	18·84	10·68	11·95	12·00	10·51	10·35	9·67	9·03
3–4 ,,	25·95	17·51	18·35	13·54	11·27	9·27	6·55	6·63	6·36
4–5 ,,	25·65	23·69	21·91	21·07	20·18	19·56	18·10	16·20	16·64
5–6 ,,	26·42	25·60	24·50	24·00	23·54	22·45	20·82	19·45	18·99
6–7 ,,	26·42	26·00	25·00	25·00	25·30	25·26	24·5	23·10	24·00
Total	169·12	146·69	133·00	125·88	123·18	120·85	107·57	104·32	100·81
Rainfall in inches since last determination.....		0·82	nil	nil	1·14	1·85	0·89	2·08	

The showers only seem to have affected the surface layer. It will be observed that there is a considerable break below the fourth foot; this is due to a change in the soil, which unfortunately was not uniform throughout the entire depth. Taken as a whole, the figures show that the rate of loss decreases as the depth increases, but the want of uniformity of the soil makes it impossible to get out any expression showing the rate of loss. Dr. Leather argues that water moves upwards from a limited depth only, and considers that none has come from the seventh foot, but he offers no evidence on this point. The results are equally well explained on the supposition that the upward movement takes place at all depths, since the amount of water present in a particular layer depends on the respective rates at which water is gained from below and lost to the upper layers. If these measurements could be repeated on a fairly uniform piece of soil the results would furnish very valuable data for a study of the movements of water in soil.

E. J. RUSSELL.

LORD KELVIN.[1]

THESE notices of the life and work of Sir William Thomson, Lord Kelvin, are all true, and they are all quite different from one another. Prof. Larmor dwells upon the important mathematical theorems with which Lord Kelvin enriched natural philosophy, and he is almost indignant that mere inventions for the service of man should have occupied the best time in the life of the greatest of naturalists. It is a masterly essay, and will be of the greatest value to some future biographer or historian of science. As Stokes and Fitzgerald are dead, there is nobody now living who could have done the work so well as Larmor. Nobody ever could have done it better.

Prof. Gray's book gives a very straightforward and interesting account of Kelvin's work; he does not dwell so much upon that part which had the higher mathematical aspects; he writes as an old pupil, as one who was Kelvin's secretary, and as the present occupant of his professorial chair. Probably this book will give most satisfaction to the general reader, but the reader must be one who already knows something of what Kelvin did in electricity and magnetism, and elasticity and light and thermodynamics. It gives an interesting account of college life and Kelvin's relations with his assistants and students.

Prof. Ayrton's article, in spite of an obvious restraint, is intense with affection and enthusiasm for the memory of his master. He dwells on none of the great theorems which are of fundamental importance in all applications of mathematics, which indeed created many parts of natural philosophy; he only casually mentions the discoveries and inventions of his chief, for he assumes that they are all well known; he merely recalls his own experiences of forty years ago, and his story is alive with interest, with reminiscences of a thousand acts of kindness and words of sympathy from a man who never seemed to remember his greatness when he was talking to a student, for indeed he was always a fellow-student.

Prof. Thompson's lecture, delivered to the members of the Institution of Electrical Engineers, was perfect for its purpose. He touched on most of Kelvin's work, but in particular he recalled to the leaders in electrical engineering the history of their profession. That history may be said to begin with Faraday and with Thomson's papers when he was not yet twenty years of age, papers in which he recognised the inner meaning of Faraday's work. Until he died he never ceased to make electrical history, but the most wonderful time was the time of his youth, when he was developing the theories which were to educate Maxwell. The lecturer recalled the practical electrical engineering work of the man who, when he died, was president of the institution for the third time. This is not the place to speak of the many other tributes which have lately been written to Thomson's genius and ability. The real life of Lord Kelvin has yet to be written, and the biographer will take account of the notices now before us, as well as many others, and he will especially use that masterly essay by Fitzgerald which was prepared for the Kelvin jubilee.

To us, Prof. Larmor's notice is the most wonderful of these productions. Was there ever so long an obituary notice of a Fellow in the Proceedings of the Royal Society? And this notice is filled not only with an enumeration of the contributions of Kelvin to applied mathematics, with sufficient detail to keep the reader intensely interested, but also with ungrudging praise. To anyone who knows the severity of Prof. Larmor's criticism, the almost impossibly high standards which the modern Cato is in the habit of applying to all scientific work involving mathematics, this obituary notice will count as the greatest praise ever given to any scientific man! It is from another point of view that we would ask students to read particularly what Prof. Larmor says about the memoirs of Clausius of 1850 and Thomson's papers on thermodynamics until 1851 and on to 1855. It is just possible that the men who think they know the thermodynamic events of that most interesting time may find that Thomson's habits of self-effacement have made it necessary now to re-write the history. We know that it was all one to him; he never made a claim for priority except on behalf of somebody else than himself. We are sorry to say that we can make no more comments on these essays; when we try to write, memory throngs too much with reminiscences and power of expression fails us. He is still too close to us; affection and emotion are overpowering. We have

[1] Proceedings of the Royal Society; Obituary Notice of William Thomson, Baron Kelvin. By J. L. Pp. i+lxxvi.

"Lord Kelvin, an Account of his Scientific Life and Work." By Dr. Andrew Gray, F.R.S. (English Men of Science Series.) Pp. ix+318. (London: J. M. Dent and Co., 1908.) Price 2*s.* 6*d.* net.

"Kelvin in the Sixties." By Prof. W. E. Ayrton, F.R.S. An article in the *Times* Engineering Supplement, January 8, 1908.

"The Kelvin Lecture." By Prof. Silvanus P. Thompson, F.R.S. Proceedings of the Institution of Electrical Engineers.

been under the spell of the presence of a truly great man; it is impossible to describe our experiences. We loved him as no master was ever before loved by his disciples. We know something of the greatness of his work, but we are too close to him to measure its real grandeur. It is only at far-away Interlaken that one can see the magnificence of the Jungfrau; it will be a hundred years hence that anybody will be able to write justly about Kelvin. That Ayrton should write as he has done was a thing astonishing to many, but quite expected by us. That Larmor should have written as he has done has filled us with unspeakable pleasure.

THE STATURE OF THE RACES OF EUROPE.

THE spread of interest in anthropometry during recent years is clearly indicated in the second part of Dr. Deniker's treatise on European ethnography, which has just been issued by the Association Française pour l'Avancement des Sciences. A comparison of the data collected by the author in this paper with those he was able to draw on for his Huxley memorial lecture in 1904 shows that all over Europe active work is in progress, and that many of the gaps in our knowledge of the physical characters of the living populations are being rapidly filled.

In the present paper Dr. Deniker has supplemented his observations on the cephalic index published in 1899 by a study of the average stature of the male population of the various territorial units of Europe, the results being shown by means of varying shades and colours on a large-scale map. There are separate shades for each difference of twenty-five millimetres in average stature between 1599 and 1725.

The greater part of the material available for study consists of returns of the stature of conscripts in the various countries, and unfortunately the mode of return employed is not uniform. In some States the returns include the stature of all called up for service, whether ultimately enrolled or not, while in others the figures for those rejected from military service on account of deficiency in physique or other causes are omitted. To obviate as far as possible the difficulty arising from this difference of method Dr. Deniker has designed and applied various correction factors. In the main these have consisted in adding one centimetre to allow for growth subsequent to the age of twenty, when the average was based on the stature of all called up for service, whether ultimately accepted or rejected; to make no change when the stature of accepted individuals only was recorded, the deficiency of the rejected being regarded as a counterpoise to the subsequent growth of the recruits actually enrolled; and to deduct a centimetre from the average when it was based on measurements of soldiers between twenty-two and twenty-five years of age.

Dr. Deniker would seem to have utilised every possible source of information, with the result that the bibliography appended is most exhaustive, and is particularly valuable in its references to publications in the various Slavic languages. The value of the averages as recorded on the map shows wide variation, since they are based in some cases on thousands of observations, and in others only on tens. This is pointed out in the text, but it might be possible in a succeeding volume to indicate by shading, not, as in this case, the actual average, but the range within which subsequent series of averages might be expected to fall.

Information is absolutely lacking from very few districts, chiefly small areas in Russia and the Balkan peninsula, though in these countries recent work has done much to fill up the gaps appearing in previous maps of the distribution of physical characters. Far more regrettable is the fact that there are no returns at all of stature from North Germany other than Schleswig-Holstein and part of Mecklenburg. This is the more astonishing when we consider the standing and the activity in other directions of the German school of anthropology.

The map shows that the populations with the tallest average stature are to be found bordering on the shores of the North Sea and the Baltic in the British Isles, Scandinavia, Finland, and Esthonia. These people, also characterised by long heads and fair or light brown hair, are termed by Dr. Deniker the Nordic race. This term is coextensive with Teutonic, the designation more commonly employed in this country, but presents the advantage of being less liable to misconception.

The word Teutonic is rapidly tending to become as comprehensive and therefore useless as the word Celtic.

Another zone of tall populations stretches up through the Balkan peninsula into Central Europe as far as the Tyrol, and a third is situated in the Caucasus.

These latter populations are broad-headed, and, as has been pointed out by Prof. J. L. Myres, very probably represent a race which entered Europe at the close of the Ice age from the Anatolian highlands, and are referred to by Dr. Deniker as the Adriatic or Dinaric race.

Short statures predominate in two great centres, Russia, where the population is in the main broad-headed, and the Italian and Iberian peninsulas, where long-headedness is the rule. The former group is termed the Oriental race; the latter, usually referred to in this country as the Mediterranean or Iberian race, has been divided by Dr. Deniker into two groups, according to stature. Where the average exceeds 165 centimetres he refers to a population as belonging to the Atlanto-Mediterranean race; where it is below this level he terms them Ibero-Insular. Since in other characters the two groups are very similar, it would seem doubtful if the subdivision were quite necessary. The remaining populations of Europe are of intermediate stature.

The division of the European populations into northern and southern long-headed groups, the former characterised by tall stature and fair hair, and the latter by short stature and dark hair, rests on plainly established foundations, and all the members of each group are clearly related, though it is uncertain whether the two main groups had a common origin in comparatively recent times. The relations of the central European broad-headed group are less clear, and further research is needed to determine the affinities, if any, of the Cevenole or Alpine race of short broad-heads with the short eastern European broad-heads who chiefly speak Slavic languages and the taller Balkan and Caucasian broad-heads. It is only by more complete knowledge and detailed analysis, such as characterises the present work, that we may look for answers to these and allied problems.

The value assigned to the population of the British Isles in Dr. Deniker's map is probably an example of the dangers of incomplete surveys. From the figures obtainable chiefly from the report of the British Association Committee in 1883, and the work of Haddon and Browne, Beddoe, Gray and Tocher, it would seem that this country presents the highest