ment. He endeavours to show that there are three periods in the history of luxury,—one in which it is coarse and profuse ; a second in which it aims mainly at comfort and elegance ; and a third, proper to periods of decadence, in which it is perverted to vicious and unnatural ends. The second of these began, in modern times, with the emergence of the Western nations from the mediæval period, and in the ancient communities at epochs of similar transi­tion. Roscher holds that the sumptuary legislation which regularly appears at the opening of this stage was then useful as promoting the reformation of habits. He remarks that the contemporary formation of strong Governments, disposed from the consciousness of their strength to interfere with the lives of their subjects, tended to encourage such legislation, as did also the jealousy felt by the hitherto dominant ranks of the rising wealth of the citizen classes, who are apt to imitate the conduct of their superiors. It is certainly desirable that habits of wasteful expenditure and frequent and wanton changes of fashion should be discouraged. But such action belongs more properly to the spiritual than to the temporal power. In ancient, especially Roman, life, when there was a confusion of the two powers in the state system, sumptuary legislation was more natural than in the modern world, in which those powers have been in general really, though imperfectly, separated. How far regulation of this kind could, and might usefully, be carried out by a spiritual power under purely moral sanctions, and whether and to what extent social offices, private as well as public, should be discriminated by costume, are questions which need not be dis­cussed at present. Political economists are practically unanimous in their reprobation of the policy of legislative compulsion in these matters. In a well-known passage Adam Smith protests against the “impertinence and presumption of kings and ministers in pretending to watch over the economy of private people and to restrain their expense, being themselves always and without any exception the greatest spendthrifts in the society.” Yet he does not seem to have been averse to all attempts to influence through taxation the expenditure of the humbler classes. The modern taxes on carriages, coats of arms, hair-powder, playing-cards, &c., ought perhaps not to be regarded as resting on the principle of sumptuary laws, but only as means of proportioning taxation to the capacity of bearing the burden.

The *loci classici* on Roman sumptuary laws are Gellius, *Nodes Atticæ,* ii. 24, and Macrobius, *Saturn.,* iii. 17. On the similar English legislation Henry’s *History of Great Britain* may usefully be consulted. One of the best extant treatments of the whole subject is that by Roscher, in his essay *Ueber den Luxus,* republished in his *Ansichten der Volkswirthschaft aus dem geschichtlichen Standpunkte* (3d ed., 1878). (J. K. I.)

SUMY, a district town of Little Russia, in the govern­ment of Kharkoff, situated 125 miles to the north-west of the chief town of the government, was founded in 1652 by Little Russian Cossacks. It is poorly built, chiefly of wood, but is an important centre for the trade of Great Russia with Little Russia,—cattle and corn being sent to the north in exchange for various kinds of manufactured and grocery wares. It has a classical pro-gymnasium and a technical school. Its inhabitants, who numbered 16,030 in 1884, are engaged in commerce, in various kinds of petty trades, and in agriculture.

SUN. In the article Astronomy (vol. ii. p. 768 *sq.)* the sun has been considered as a member of the solar system, and references are given to various discoveries which have been made from time to time relating to its physical and chemical constitution. In the present article we propose to consider the sun as a star, and to state as briefly as may be the views at present held regarding its structure, and subsequently to refer to the most recent observations dealing with the physics and chemistry of the various phenomena which are open to our study.

The sun as ordinarily visible to us, bounded by the photosphere, is only a small part of the real sun : from observations made during eclipses it is now known that outside the photosphere are—first, an envelope, namely the chromosphere, which is mainly composed of hydrogen, and outside this another envelope, called the corona, while there is evidence that outside these, and especially along the plane of the sun’s equator, there is a considerable ex­tension of matter which may or may not be of the same nature as that of which the corona is composed.

These various parts of the solar economy have been examined by the spectroscope, and from this examination two widely divergent views have arisen.

According to the first view, the true atmosphere of the sun is limited by the chromosphere, and the constituents of that atmosphere consist essentially of the vapours of the chemical elements recognized on the earth. It will be seen that on this view the corona and the equatorial extension observed occasionally are merely solar appendages. In the other view the atmosphere of the sun is extended to the confines of the corona, the temperature naturally increasing as we descend ; and it is held that towards the photosphere the temperature is so high that the chemical elements are dissociated into finer forms of matter, so that descending vapours get more simple, ascending vapours get more complex, and it is only in the cooler regions of the atmosphere that vapours resembling those of our ter­restrial elements can exist, while near the confines of the corona these vapours give place to solid particles and masses. Broadly stated, these divergent views have arisen from the application of two distinct methods of inquiry. In one method, light coming from every portion of the sun, and reflected, let us say, by a cloud into the spectroscope, gives us a spectrum full of absorption lines, and these lines are practically constant from year to year. In the other method, each minute portion of the solar economy has been examined bit by bit, and thus we have the spectrum of the spots, the spectrum of the promi­nences, the spectrum of the chromosphere, the spectrum of the corona. All these spectra vary enormously, not only among themselves, but from year to year ; and, when we consider merely the spots and prominences, we may say that they vary from spot to spot and from prominence to prominence.

It will be obvious that the true mean density of the sun cannot be the same on the two hypotheses to which we have referred. If the atmosphere is practically limited by the photosphere, it has been found that the density of the sun is L444, water being taken as unity. If we include the corona in the sun’s atmosphere, and assume that its height is half a million of miles above the photo­sphere, then the volume of the sun is ten times that bounded by the photosphere, and the density is reduced to a tenth of the value given above.

We next proceed to discuss the chemical results obtained by the first method of inquiry to which reference has been made. For these results we are of course dependent upon comparisons of the lines given by various incandescent vapours with the Fraunhofer lines seen in the ordinary spectrum of the sun. If by such means complete evidence is afforded of the existence of one of our chemical elements in the sun, it is obvious that no information is given as to its precise locality ; further, if the high temperatures used in our laboratories to produce a spectrum should break up the molecules of the vapours as known to the chemist into finer ones, and if the temperature of the sun were to do the same, there would still be a considerable similarity between the solar and the terrestrial spectrum of any one substance.

The first (A) of the following tables gives the substances present in the sun’s atmosphere according to (1) Kirchhoff, and (2) Angstrom and Thalén.

Table A.

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| --- | --- |
| Kirchhoff·. | Sodium, Iron, Calcium, Magnesium, Nickel, Barium, Copper, Zinc. |
| Angstrom and Thalén. | Sodium, Iron, Calcium, Magnesium, Nickel, Chromium, Cobalt, Hydrogen, Manganese, Titanium. |

A subsequent method of inquiry, which was capable of tracing merely a small quantity, gave the additional sub­stances shown in Table B.