

coke as on the gas, and cater for the supply of a good domestic fuel at the price of coal, instead of treating coke purely as a by-product, the demand for it would soon reach a point that would enable the desired reductions in the price of gas to be made. There is no need to fear as to the other by-products; the output of sulphate of ammonia could be doubled without affecting the market, and a good tar will look after itself; it was high heats that ruined the tar market, and with the demand for tar increasing for road work, no flooding of the market need be feared.

During the last few years the statement has several times been put forward that "as the gas manager's end and aim is gas, it is his duty to obtain the greatest volume of gas possible per ton of coal"; but with this I venture to disagree. The gas manager's duty is to obtain the greatest possible value per ton of coal, and until every industry dealing with coal recognises that in this respect its aim is the same, little economy will be possible in our rapidly diminishing store of coal.

The pressing of temperatures in carbonisation to higher and higher degrees with the old conditions of lightly charged retorts has given larger yields of gas, but it has loaded the gas with carbon bisulphide, depreciated the coke, and ruined the tar; and one of the chief claims for the adoption of the full-charge horizontals and intermittent vertical retorts for carbonisation is that they have improved the character of both coke and tar.

As I have shown, this is due to a certain proportion of the gas and tar vapour coming off through the cool core and so escaping over-cracking, but it can be only a partial improvement; whilst, so far as the coke goes, the nearer it approaches metallurgical coke the less it is fitted for a domestic fuel. True it is, that where the coke has been made harder and brighter the gas manager's market has improved; but it has been for use in furnaces, manufacturing processes, and for producers that the increased demand has been felt, and not for domestic use.

Even for the heating of furnaces the coke made at extreme temperatures is not so good as when the heats were slightly lower; and in Germany this is beginning to be recognised, and Körting, in a paper read this summer (1911), points out that the inclined settings, which used to work with 12 per cent. of fuel, now require fully 16 per cent., an increase due partly to higher temperatures, but largely to more highly carbonised coke.

Already the strides forward which gas has made as a domestic fuel are telling the tale in our atmosphere, and the yellow fogs of the last century are getting rarer; and if coke could be made a domestic fuel by leaving in it 6 to 8 per cent. of volatile matter to facilitate ignition and give a flame, the gasworks of the country could command the fuel market.

Remember that the sale of gas cannot be pushed beyond a certain point without overstocking with coke; the sale of both *pro rata* must be pushed, and if only you could be persuaded that this is the right road, you would be backed up by the smoke reformers and the public, and find yourselves able to sell a fuel coke at the price of the best coals.

I have shown that the factor for which you ruin your coke as a domestic fuel is about 3000 cubic feet of gas of the same value as blue water gas; the 3000 cubic feet of gas left in the coke would be worth four or five shillings a ton on the selling price, and the cost of replacing it by water gas would be about one shilling, whilst the creation of a large domestic market would enable a reduction in the price of gas to be made that would still further increase its use as a fuel.

Now I am sure in my own mind that these are the lines the gas industry should consider seriously, and that the advances in the next ten years must be an endeavour to get nearer to the ideal of carbonisation and to improve both gas and coke.

In a course of lectures such as these, four seems an ample allowance at the commencement—and probably to the audience more than ample at the end—but I realise only now how miserably inadequate the time has been for the expression of the matter I desired to bring before you, and can only hope that some of the points, controversial though they may be, will prove helpful in considering the carbonisation of coal.

### UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

THE committee formed to promote a scheme for providing a college of university rank at Brighton has resolved that the scheme shall be one for establishing a constituent college of London University for the county of Sussex, the subjects to be arts, sciences, engineering, and pedagogy in the first instance, but medicine and law to be undertaken later.

THE Old Students' Association of the Central Technical College is organising a dinner to celebrate the election of Prof. W. C. Unwin, F.R.S., as president of the Institution of Civil Engineers. The dinner, which will be held at the Criterion Restaurant on Saturday, February 10, is intended to be a gathering of old students of the Central Technical College and Prof. Unwin's students at Cooper's Hill. The chair will be taken by Mr. W. Duddell, F.R.S., president of the Central Old Students' Association. Tickets may be obtained from Mr. G. W. Tripp, 4 Fairfield Road, Charlton, Kent.

SEVERAL gifts to American universities are announced in the issue of *Science* for January 12. Mr. Jacob H. Schiff has given 20,000*l.* to Cornell University to promote studies in German culture; the 200,000*l.* fund for the further endowment of the medical school of Western Reserve University has been completed; and De Pauw University has just brought to a successful close the campaign to raise 80,000*l.* to meet the conditional gift of 20,000*l.* from the Rockefeller Educational Board. The subscriptions amount to a little more than 88,000*l.* This will make the productive endowment of the University something above 200,000*l.*

THE late Dr. R. D. Roberts, whose death occurred on November 14 last, left estate of the gross value of 10,024*l.*, of which the net personalty has been sworn at 6021*l.* He bequeathed the ultimate residue of his property "to the University College of Wales, at Aberystwyth, to form the nucleus of a fund to be formed and administered in accordance with a scheme to be prepared by the said University College, and approved by my trustees, to enable professors, after a certain number of years of service—say, not less than ten—to be released from the professorial duties for a period of about a year, and, at any rate, not less than six months on full salary, a substitute being paid out of the income of the fund, the purpose of this release from college duties being to enable the professor to refresh his mind by travel or research or visits to other universities, and so gain fresh stimulus and equipment for his work."

It has been announced that the ordinance for the institution of degrees in veterinary science promoted by the University of Edinburgh has been passed by the Privy Council, and has received his Majesty's sanction. The ordinance will come into operation at the beginning of the next summer session, and by it the University is empowered to confer the degrees of Bachelor of Science and Doctor of Science in veterinary science. The Edinburgh veterinary student will now be in a position to obtain an academic distinction in addition to the diploma of membership of the Royal College of Veterinary Surgeons. The present time marks a distinct epoch in the history of veterinary science in Scotland. The Royal (Dick) Veterinary College—the original Scottish veterinary school—is about to enter upon a fresh era, inasmuch as it has been decided to erect new and up-to-date buildings on a scale which will do credit to the important educational centre in which it is located. At the same time, the students of the college are being afforded the means of entering the ranks of university graduates. These developments cannot fail to exert an important effect upon veterinary teaching in Edinburgh and upon the veterinary profession in Scotland.

### SOCIETIES AND ACADEMIES.

#### LONDON.

Royal Society, January 18. — Sir Archibald Geikie, K.C.B., president, followed by Sir A. B. Kempe, vice-president, in the chair.—Dr. J. S. Haldane, C. Gordon Douglas, Dr. Y. Henderson, and Dr. E. C. Schneider: The physiological effects of low atmospheric pressures, as observed on Pike's Peak, Colorado. The