

What Chemists Do

Experimenters Who Found Great Industries

TO most people a chemist is a man who presides over a shop that is notable for its peculiar fragrance, and for its mysterious little wooden drawers and arrays of bottles filled with attractive-looking liquids of various colours. A chemist of this kind is actually a pharmacist, and his main business is to compound drugs and chemicals into medicines in accordance with prescriptions sent to him. In this article we are concerned with the scientific chemist, whose mission is much wider. He probes into the secrets of the materials of which all things are made, and the whole world is his province. He is ready to test and examine anything dug out of the earth, or extracted from the sea or from the air, and his work is the basis of most of our important industries.

Let us see what such a chemist does. In the first place he is an analyst, that is to say he pulls materials to pieces in order to find what they are made of, and how they are built up. For this purpose he examines them with the aid of a microscope and other instruments, heats them, pours acids and other chemicals of all kinds on them, and forms his judgment on the basis of the clues these tests give him. This is very important work, and it takes many different forms. For instance, the chemist may be employed in an iron and steel works, a dyestuff factory, an oil and petrol refinery, or some great manufacturing concern. There he tests the raw materials employed, in order to ensure that they are of the requisite purity, and suitable for the changes they are to undergo in the giant furnaces, retorts, vats and autoclaves in which chemical operations are carried out on a large scale. Further, at every stage he analyses the products, in order to make sure that the changes are proceeding in a satisfactory manner.

The analytical chemist may be engaged also in the examination of foodstuffs and of drugs and other chemicals. Work of this kind is so necessary that analysts are specially appointed by local authorities for the purpose of ensuring the purity of water, milk and foods of all kinds, and for making special tests and analyses in the interests of the public. Occasionally this may include detecting the work of the poisoner, and the

analyst often appears as a valuable ally of the police.

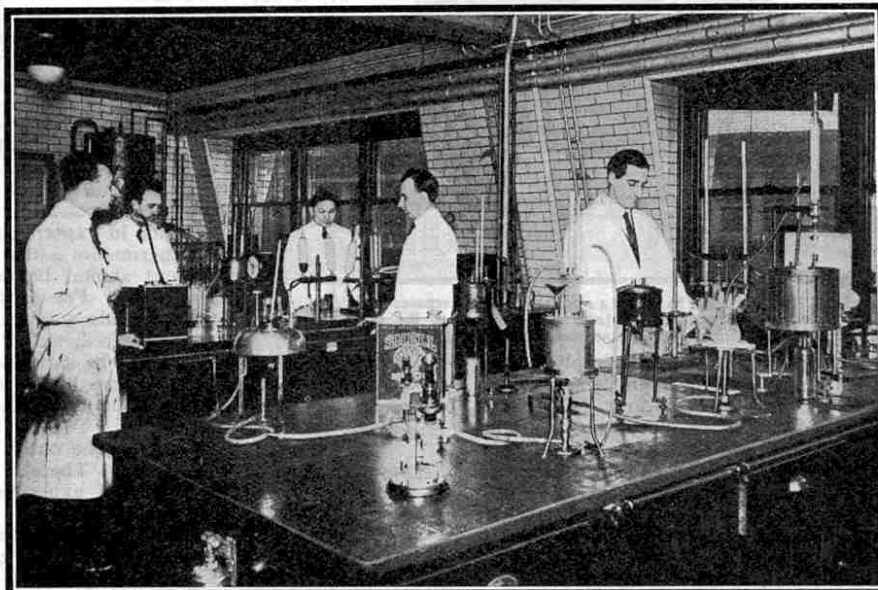
The chemist is more than the watchdog of industry, however. He is the creative magician who transforms unattractive and apparently useless stuff into beautifully coloured dyes, sweet smelling essences, and thousands of other wonderful products. The most amazing example of this is the transformation of coal tar, the dirty, black and evil-smelling liquid collected during the manufacture of coal gas. At one time this was a waste product and a nuisance to its makers, but in 1865 W. H. Perkin, a young English chemist, quietly working during his Easter

holidays in a small laboratory he had fitted up at home, extracted a beautiful mauve dye from the unpromising liquid. This single experiment was the beginning of an entirely new industry that to-day is one of the most important in the world, for the work of chemists has revealed the existence of thousands of brilliantly-coloured dyes that can be obtained from coal tar products. These are far superior in every respect to the few dyes of vegetable

origin previously in use, for they provide a greater range of colours, and are more brilliant and durable.

Even the famous Tyrian purple of the ancients, which at one time was reserved exclusively for the use of the Roman Emperors, has been surpassed by the modern chemist. The old dye was obtained from certain shellfish found in the Eastern Mediterranean, and it would have been necessary to dissect about a quarter of a million of these tiny molluscs in order to obtain an ounce of the dye-stuff! To-day it can be made readily from coal tar, but it is no longer used, for the chemist has replaced it by similar colours that are far more brilliant and attractive.

The research chemists on the staffs of great industrial firms take up promising laboratory experiments and work on them until they are transformed into successful industrial operations. Many of the magnificent results brought about in this way are achieved by team work, but the day of the lone chemist is by no means over. Only a few years ago, for instance, an English chemist working alone devised in a month a new process for the production of a certain dye that previously had been a German monopoly, and quickly developed it into a new industry.



Chemists engaged in testing "Shell" oils at one of the laboratories of Shell-Mex Ltd., to whom we are indebted for our photograph.