monly accepted purpose. This is a beneficent by-product of the war.

Of this general result, English experience furnishes specific illustration. From the time when the Prince Consort, in the middle of the last century, imported a German chemist to the Royal College of Chemistry in London (one of whose pupils was this same William H. Perkin, who discovered the first synthetic dye and who, as Sir William Perkin, confronted Professor Duisberg with the evidence of an earlier synthetic process for making rubber), the English government gradually increased its efforts in behalf of science. But it was not until after the war had begun, in 1915, that it made direct financial provision for researches "undertaken with definite utilitarian objects." Out of this came the Department of Scientific and Industrial Research, which maintains a number of stations of its own, but which functions chiefly through associations. In them different firms unite to maintain additional stations, the government making grants in aid.

This procedure has tended to help companies that could not support independent laboratories and has had the wholesome effect of diminishing trade secrecy through the exchange of experience. Chemical "invention" is so different from mechanical invention that it is difficult to give sufficient encouragement through patents without preventing to some extent the general cooperation which these associations seek. Many chemical patents, and this is true not alone in England, hold the key to subsequent discoveries and may be of little value unless those discoveries are made. They tend thus to block the way to other workers. To maintain such a balance as will encourage research effort and yet not discourage further and intensive effort will require serious international consideration and cooperation, and this society should be most helpful in establishing that delicate balance.

It is stated that chemists have added twenty billion dollars to the world's wealth. This is probably not an exaggeration if credit for this vast increase is shared with the industries that have translated to human uses the chemist's formulae. The race would face tomorrow with considerable anxiety if the chemist had come not "to replace Nature's syntheses," but to supplement them. His mind is, after all, the most potent catalyst.—*The New York Times.*

SCIENTIFIC BOOKS

Le Plateau Central de la France et sa bordure méditerranée. Etude morphologique. By HENRI BAULIG. Armand Colin, Paris, 1928. 591 pages, 33 half-tone views, with 11 folded sheets in pocket; 4 of river profiles, one of geological sections, and 6 of contoured maps, 1: 200,000, with volcanic areas, oligocene deposits and chief river names in red, but no names for small streams or towns.

HENRI BAULIG, lecturer in geography at the University of Strasbourg, has produced a studious treatise on the Central Plateau of France, which, in giving a keen and thorough morphogenetic discussion of that interesting region, presents a minute analysis of its geological history and an argumentative demonstration of its progressive development rather than a direct description of its visible forms, such as might be expected from a geography teacher. The introduction explains that the great Hercynian revolution of central Europe was followed by a long period of exceptional stability, when the Hercynian mountains were worn down to a post-Hercynian plain, which in this region extended across large areas of massive and resistant crystalline rocks and several narrowly compressed synclines of stratified rocks, and which in the completeness of its degradation has had no later parallel in Europe. The plain was depressed, invaded by the sea and buried under Mesozoic strata until an early Tertiary upheaval with moderate deformation caused emergence and introduced a second period of erosion, when the crystalline rocks of the central area were again laid bare and worn down, but at a lower level and over a smaller area than before, to an Eogene peneplain or plain of degradation, while the gently slanting Mesozoic strata surviving in the marginal area, where the post-Hercynian plain is still buried, were evenly beveled across. In mid-Tertiary time the Eogene plain was fractured into innumerable blocks and the blocks were diversely displaced, some being moderately upheaved, while others were depressed. Many volcanic eruptions then took place, especially on the uplifted areas, while the more deeply depressed blocks became the seat of fluviatile and lacustrine deposition. It is by the later erosion of this much jostled region, to which a broad upheaval of late date appears to have contributed, that the present topography is developed; the uplifted blocks of resistant crystallines being only narrowly dissected, while the basins of lacustrine deposition—the Limagnes—have been broadly reduced to plains at grade with their rivers. The valleys then excavated show, as was first pointed out by Briquet, the effects of four or more successive revivals of erosion at decreasing intervals, so that in rocks of similar resistance the younger and deeper-cut valleys are nested in the higher and earlier-cut valleys, the most mature forms being preserved in the headwaters of the first excavated, and the younger forms being found in the lower courses of the latest excavated valleys. In illustration of this relation Baulig has constructed with painstaking industry numerous river profiles, in which

the steepening of each in-nested valley-head beneath the less steep floor of the next upstream valley is repeatedly and consistently shown.

The existing features of the Limousin or westernmost and simplest division of the region, where the Eogene plain on the crystallines is little dislocated by fractures and is wholly free from volcanic additions, receive the best description. The surface is almost ideally plain over certain areas; elsewhere it is either surmounted by heavy-bodied residual mounts or trenched by later-carved valleys. Where the beveled marginal covering strata are weak, they are in some localities worn away so as to reveal in their foundation a part of the ancient, post-Hercynian plain, which makes a small angle with the Eogene plain of the central area. The Eogene plain slopes with the fall of the old rivers that drained it, and the rivers are therefore classed as "consequent"; but in a sense quite unlike that originally given to the term by Powell. The eastern and southern divisions of the region are so elaborately fractured that their description, not illuminated by simplified diagrams, is obscured in a multitude of technical details which a foreign reader must find difficult to apprehend. Indeed, nearly the whole volume is arduous reading, because of the frequent mention of local features—Coiron, Forez, Margeride—as if they were universally known, as well as because of repeated and unexplained references to geological formation—Lutitienne, Sannoisienne, Stampienne—and to names of insignificant towns—Cusset, Charray, Panouval—and streams—Truyère, Sumène, Alagnon—for which no location is intimated in general terms. One must regret that so competent a study of so interesting and instructive a region is not presented in a form more easily understood by others than French specialists.

W. M. DAVIS

SPECIAL ARTICLES

THE EFFECT OF COD LIVER OIL ON THE DELAYED COAGULATION TIME FOLLOWING EXPERIMENTAL OBSTRUCTIVE JAUNDICE

BLOOD coagulation is delayed in both clinical and experimental obstructive jaundice. The cause of this delay has been studied by many investigators. King and Stewart[1] observed a delayed blood coagulation *in vitro* when bile pigments were added to the blood. They interpreted this delayed blood coagulation of jaundiced animals as due to insufficient available calcium. Further evidence for the existence of a functional calcium deficiency is found in the work of Lee and Vincent[2], Walters and Bowler[3], Kirk and King[4].

Calcium chloride and parathyroid extract have been reported to be of value in the preparation of jaundiced patients for operation and also of value in controlling hemorrhages from various causes.[5, 6, 7, 8] In some previous work the author reported favorable results in the treatment of symptoms of thyro-parathyroidectomized dogs by using cod liver oil in addition to a mixed diet (1928a) and also cod liver oil and yeast (1928b).[9] It would seem that if cod liver oil is of value in this calcium disturbed condition, it might be of value in mobilizing calcium in obstructive jaundice and consequently in reducing the coagulation time. Before this work was completed, an article appeared by Liu[10] in which he showed that cod liver oil increased both fractions of the serum calcium, the diffusible and the non-diffusible. The former increased more than the latter. This adds to the rationality of using cod liver to hasten blood coagulation in jaundiced animals in which diffusible or available calcium is low.

Blood was drawn from the external saphenous vein or heart of dogs, and the coagulation time was determined by the method of Lee and White.[11] It was found that more accurate and consistent results could be obtained by using ten mm tubes instead of eight mm, as used by Lee and White. The tubes and syringe were washed with soap and water and rinsed with normal saline. To insure accuracy, four tubes, each containing 1 cc of blood, were used and the average coagulation time of the four determined. The calcium estimations were made by the Kramer and Tisdall method, modified by Collip and Clark.[12]

After having determined the normal coagulation time, the common bile duct was doubly ligated and

[1] King, J. H., and Stewart, H. A., *Journ. Exp. Med.*, xi, 673, 1909.

[2] Lee, R. I., and Vincent, B., *Arch. Int. Med.*, xvi, 59–66, 1915.

[3] Walters, W., and Bowler, J. P., *Surg., Gynec., Obst.*, 39: 200, 1924.

[4] Kirk, P. L., and King, C. G., *J. Lab. and Clin. Med.*, 11: 921, 1926.

[5] Walters, W., *Surg., Gynec., Obst.*, 33: 651, 1921.

[6] Grove, W. R., and Vines, H. W. C., *Brit. Med. J.*, 791, 1922.

[7] Cantarow, A., Craven, W. R., and Gordon, B., *Arch. Int. Med.*, 38: 502–509, 1926.

[8] Gordon, B., and Cantarow, A., *J. A. M. A.*, 88: 1301–1302, 1927.

[9] Brougher, J. C., *Am. Journ. Physiol.*, lxxxiv, 583, 1928(a). In press (1928b).

[10] Liu, S. H., *Chinese Journ. Physiol.*, i, 331, 1927.

[11] Lee, R. I., and White, P. D., *Am. J. Med. Sc.*, 145, 495, 1913.

[12] Clark, E. P., and Collip, J. B., *Journ. Biol. Chem.*, lxiii, 296, 1925.