

The beginning of the fifth and last part of Unsöld's book is devoted to the applications of the theory of Fraunhofer lines to the problems of spectral classification, and to a quantitative analysis of the solar atmosphere. The last two chapters deal with the outer layers of the sun. Here, we find, first of all, studies on sunspots, faculae and granulation (an example of the role of convection in stellar atmospheres), and, further, an account of our physical knowledge of prominences, the chromosphere, and the corona.

The work is concluded by a well-arranged bibliography, which comprises no fewer than 1,800 entries.

A review of this unique book can only give an outline of its contents and its purpose. The author has fulfilled his intentions in an admirable way; and his work is likely to prove indispensable to all workers in astrophysical and related fields. It fills a real gap in astronomical literature, in which we were lucky enough to welcome some time ago Rosseland's "Theoretical Astrophysics", treated on quite different lines (see *NATURE*, 138, 628, 1936). Prof. Unsöld has rendered a great service to astronomers as well as to physicists, who will be glad to make use of the fundamental problems and their solutions arising from a study of those great physical laboratories, the stars.

A. B.

## The Liberal Arts Applied to Modern Medicine

**The Doctrine of Signatures:**  
a Defence of Theory in Medicine. By Scott Buchanan. (International Library of Psychology, Philosophy and Scientific Method.) Pp. xv + 205 + 20. (London: Kegan Paul and Co., Ltd., 1938.) 7s. 6d. net.

**I**N the form of a plea for renewed freedom of speculation in thought, Prof. Buchanan has written a very interesting book in which he is not concerned with social and political restraints, but with the far more stultifying hesitations in the minds of thinkers of the present time. He is alarmed to find all around him, evidence of the fact that the intellectual process is being called in question and its consequences feared. As subject-matter for investigation, Prof. Buchanan has chosen the science and profession of medicine, which throughout European history has always fought and won the battle for freedom of thought, but which, now that it is in possession of victory, stands hesitating at the head of the sciences, burning with intellectual energy and imagination but not knowing which way to go. In Prof. Buchanan's opinion, modern medicine is suffering from a lack of balance of the intellectual virtues, and while it has a "maximum of informatory knowledge, has a minimum of understanding".

For this unhappy state of affairs, Prof. Buchanan prescribes two remedies, which he maintains are forgotten rather than new. These are the use of symbols and of demonstration—or in other words, the application of the liberal arts—the trivium and the quadrivium, to medical education. Here, the patient becomes a text to be read and translated according to the rules of medical grammar. For according to the doctrine of signatures, medical knowledge consists of seeing the connexions between symptoms and remedies; and the liberal arts are

concerned with signs and symbols and also with the levels of generality and abstraction that appear when symbols are used. Prof. Buchanan accuses modern scientific medicine of elaborate empiricism and anti-intellectualism, and thinks that the doctrine of signatures and the liberal arts would be good exercise for our weak symbolic faculties. Furthermore, he alleges that the disuse of demonstration in the biological and medical sciences has tended to atrophy the understanding, and proceeds to show how Plato, Aristotle and Galen discovered and established the demonstrative power of form and matter in biological science. He thinks that its re-discovery and re-establishment would both revive and direct our stultified speculative energies.

There is no doubt that Aristotle and Galen represent the peak of Greek medical science; but Prof. Buchanan maintains that to-day we are only working out the details of their fundamental insights. To support this view, he states that students of the history of medicine are repeatedly disclosing the fact that the greatest of original modern discoveries in physiology and anatomy are but the discoveries of ideas and illustrations of principles in the Aristotelian and Galenic works. While he would not go so far as to say that there is nothing new in science, he assures us that we have yet to recognize the science which has made possible such novelty as there is. We should try to recover the doctrines of the tradition from which modern developments have grown, in the hope that they may be rendered intelligible enough to "absorb modern science within the borders of their ancient wisdom".

The subject is certainly a fascinating one, and Prof. Buchanan's treatment of it, although necessarily rather fragmentary in a book of this length, is both stimulating and disturbing.