

thousands of readings have to be made, and conclusions drawn from them by statistical methods. As examples of the work to be done he discusses the testing of rigidity, elasticity under strains, effects of variable stresses, fatigue, regularity of the spun thread, and the appearance of the finished fabric. He concludes with the recommendation that abstracts on the progress of textile research should be given their place in the chief scientific journals. The third lecture, on the physicist in metallurgy, shows the enormous importance of physics in later-day metallurgical research and practice. The most numerous and varied applications of physics, states Prof. Desch, are connected with the heating, forging, hardening, and alloying of metals. Magnetism, he tells us, is becoming of increasing importance, and atomic structure, properties of crystals and X-ray analysis, are all of actual and potential value in metallurgical research. The lectures reach a high standard, and the introductory remarks by the Hon. Sir Charles Parsons concerning the rôle of higher mathematics in applied physical research should not be overlooked.

*Arabische Alchemisten. Von Julius Ruska. 2: Ġa'far al-Šādiq, der sechste Imām. Mit einer Nachbildung der Handschrift Gotha A. 1292 (Haleb 338) in Manudruck.* (Heidelberger akten der Von-Portheim-Stiftung, Heft 10.) Pp. 128+62. (Heidelberg: Carl Winter's Universitätsbuchhandlung, 1924.) 7·20 gold marks.

PROF. RUSKA'S erudition is equalled only by his energy. He has now followed up his monograph on Chālid ibn Jazīd (see NATURE, September 20, 1924, p. 427) with an interesting and important memoir on Ja'far al-Šādiq, the sixth Imām. Included in the memoir are the text and a translation (with full notes) of an alchemical treatise falsely attributed to Ja'far, the "Book of the Letter of Ja'far al-Šādiq on the Knowledge of the Art and of the Noble Stone." The text is a facsimile of MS. A. 1292 at Gotha, and is supplemented by additions and variations from a manuscript in the Library at Rampur.

The memoir is divided into six sections: (i.) Ja'far al-Šādiq in history and legend; (ii.) the writings attributed to Ja'far; (iii.) Ja'far as the teacher of Jābir ibn Hayyān; (iv.) Ja'far as the author of chemical works; (v. and vi.) translation and text of the alchemical treatise mentioned above. Prof. Ruska's main conclusions are that Ja'far had nothing whatever to do with alchemy, that all the alchemical works attributed to him are spurious, and that he could not have been the master of the great Jābir. He says that it is quite unthinkable (*völlig undenkbar*) that Ja'far al-Šādiq could, at Medina, have come into any contact with either practical or theoretical alchemy. If this conclusion is justified, it follows that Jābir could not have learnt alchemy from him, and Prof. Ruska is therefore forced to the extremely important conclusion that "all writings ascribed to Jābir, in which Ja'far al-Šādiq is represented as his master and teacher, are to be regarded as falsifications of a later date."

Prof. Ruska's conclusions are certain to have the happy result of provoking much further research, but we feel that it is as yet too early to give unqualified assent to his criterion for judging the authenticity

of works ascribed to Jābir. His memoir is undoubtedly the most important contribution to our knowledge of early Islamic chemistry which has been made in the present century.

E. J. H.

*Statics: including Hydrostatics and the Elements of the Theory of Elasticity.* By Dr. Horace Lamb. Second edition. Pp. xii+357. (Cambridge: At the University Press, 1924.) 12s. 6d. net.

PROF. LAMB'S books on the various branches of mechanics require no introduction to the modern teacher and student of applied mathematics. By their fluency of diction, their easy mathematical style and their lucid presentation of the subject, they have displaced most of the old-established works. The interest in the announcement of a new edition lies consequently rather in what modifications the author could possibly make to improve an already excellent work.

This second edition of "Statics" differs from the earlier edition merely in the portion dealing with elastic problems. There has been made, to the chapter on the extension of bars, a valuable addition on the treatment of redundancies. Castigliano's theorem of least energy is developed, with Southwell's simple and elegant proof. The chapter on the flexure and torsion of bars now covers the case of curved bars and the collapse of a ring under pressure, while the final chapter on stresses in cylindrical and spherical shells now includes the case of rotating cylindrical shafts.

These additions are consistent with the general tendency of all the author's work, to combine with clear and lucid mathematics a close association with the realities of the subject. This new edition merely emphasises the debt which all teachers owe to Prof. Lamb's inspiration.

*Valenzkräfte und Röntgenspektren: zwei Aufsätze über das Elektronengebäude des Atoms.* Von Prof. Dr. W. Kossel. Zweite, vermehrte Auflage. Pp. iv+89. (Berlin: Julius Springer, 1924.) 3·60 gold marks.

VALENCY and X-ray spectra may appear to have little in common, but valency is essentially connected with the number and distribution of the outer electrons of the atom, while X-ray spectra provide the most powerful weapon for the investigation of those which are more tightly bound; together, therefore, these two essays involve the whole question of electron distribution. The first section contains an interesting account of the various theories of valency, and considerable space is devoted to the bearing of the crystal lattice on the problem. This new edition has been slightly enlarged, notably by the inclusion of a brief account of the Lewis-Langmuir theory. Bohr's work on the periodic table is not discussed here, since the author has decided, rightly perhaps, that it could be treated more adequately in the second essay. Here Dr. Kossel has succeeded in giving, in small compass, an admirable account of X-ray spectra and their bearing on atomic structure. He emphasises the fact that an investigation of the energy levels indicated by these spectra leads to conclusions similar to those deduced from valency considerations. The first edition was deservedly popular, and no doubt this second edition will meet with equal success, giving, as it does, a clear yet concise account of these phenomena.