tinction between true laws and such regularities lies in the very different way in which we proceed to the discovery of the one and of the other. The whole attitude of mind is so different that it is difficult to believe that the same man would have great success in the two tasks. We have seen in our day the establishment of a grand example of each kind, the Law of the CONSERVATION OF ENERGY (q.v.) and the Periodic Law. The one dealt with a small number of observations. Exactitude was the main thing. The hypothesis itself sprang almost immediately from the natural light of reason. In the other case, it was necessary with a positive effort to put ideas of exactitude aside and to find order in a great tangle of facts.

Perhaps the problem in hand relates to one of those sciences basely called descriptive, that is, sciences which study, not classes of facts, but individual facts, such as history, descriptive astronomy, geography. No science is merely descriptive. These sciences are investigations of causes. The historian's facts of observation are not those contained in his text, but those mentioned in the foot-notes —the documents and monuments. It is the supposed causes of these which make the text. Nor is he contented with a mere chronicle of striking public events; he endeavours to show what the hidden causes of them were. So the astronomer's real business is to prove the NEBULAR HYPOTHESIS (q.v.) or whatever ought to replace it. The geologist does not merely make a geological map, but shows how the existing state of things must have come to pass. To do this the historian has to be a profound psychologist, the geologist a master of physics and dynamics. Just as the classificatory sciences tend to become nomological, so the descriptive, or explanatory, sciences tend to become classificatory. The astronomer finds so many examples of systems in formation, that he can formulate the cycle of events through which they generally pass; as the historian formulates cycles through which communities usually pass, and the geologist formulates cycles through which continents commonly pass. These are analogous to the cyclical laws of the classificatory sciences.

But perhaps the problem before the student is not one of theoretical physics or of theoretical psychics, but a practical problem. He wishes to invent. In that case he ought to have a great knowledge both of facts about men's minds and of facts about matter; for he has to adapt the one to the other. He ought to know more than any pure scientist can be expected to know. Of course, as the world goes, he does not.

(2) The most vital factors in the method of modern science have not been the following of this or that logical prescription—although these have had their value too—but they have been the moral factors. First of these has been the genuine love of truth and conviction that nothing else could long endure. Given that men strive after the truth, and, in the nature of things, they will get it in a measure. The greatest difference between the scientific state of the modern scientific era from Copernicus and the middle ages, is that now the whole concern of students is to find out the truth; while then it was to put into a rational light the faith of which they were already possessed. The chief obstacle to the advance of science among students of science in the modern era has been that they were teachers, and feared the effect of this or that theory. But the salvation from this danger has been the fact that there was no vast institution which anybody for a moment hoped could withstand the mighty tide of fact. The next most vital factor of the method of modern science is that it has been made social. On the one hand, what a scientific man recognizes as a fact of science must be something open to anybody to observe, provided he fulfils the necessary conditions, external and internal. As long as only one man has been able to see a marking upon the planet Venus, it is not an established fact. Ghost stories and all that cannot become the subject of genuine science until they can in some way be welded to ordinary experience. On the other hand, the method of modern science is social in respect to the solidarity of its efforts. The scientific world is like a colony of insects, in that the individual strives to produce that which he himself cannot hope to enjoy. One generation collects premises in order that a distant generation may discover what they mean. When a problem comes before the scientific world, a hundred men immediately set all their energies to work upon it. One contributes this, another that. Another company, standing upon the shoulders of the first, strike a little higher, until at last the parapet is attained. Still another moral factor of the method of science, perhaps even more vital than the last, is the self-confidence of it. In order to appreciate this, it is to be remembered that the entire fabric of science has to

be built up out of surmises at truth. All that experiment can do is to tell us when we have surmised wrong. The right surmise is left for us to produce. The ancient world under these circumstances, with the exception of a few men born out of their time, looked upon physics as something about which only vague surmises could be made, and upon which close study would be thrown away. So, venturing nothing, they naturally could gain nothing. But modern science has never faltered in its confidence that it would ultimately find out the truth concerning any question in which it could apply the check of experiment.

These are some of the more vital factors of the method of modern science. For the purely logical elements the reader should consult special topics, e.g. REASONING, PROBABLE INFERENCE, PSYCHOPHYSICAL METHODS, ERRORS OF OBSERVATION, EMPIRICAL LOGIC, VARIATION, &c. (C.S.P., J.M.B.)

Sclerosis [Gr. σκληρός, hard]: Ger. *Sklerose*; Fr. *sclérose*; Ital. *sclerosi*. Induration of the substance of the central nervous tissue, usually by the increase of fibrillary connective tissue.

The medullary sheaths are destroyed, but the axis cylinder often persists for a long time thereafter. The blood-vessels show an increase in their nuclei and a thickening of the walls.

Multiple sclerosis: a diffuse sclerosis where foci of hardening are scattered throughout the central nervous system, especially in the white matter. The cause of the disease is obscure, and its symptoms vary by reason of the diverse sites of the lesions.

Amyotrophic (*myoatrophic*) *lateral sclerosis*: an affection of the cortico-muscular tract of the cord, appearing as a degenerative atrophy in the lumbar region. Atrophy of the muscles soon supervenes. The hardening of the interstitial tissue goes hand in hand with the swelling of the axis cylinders and atrophy of the motor neurones. The cause of the disease is unknown.

Primary lateral sclerosis (spastic spinal paralysis): this disease is characterized by exaggerated tendon reflexes and paralysis of the limbs.

Combined lateral and dorsal (posterior) sclerosis resembles TABES (q.v.). (H.H.)

Scope (in logic): Ger. *Umfang*; Fr. *étendue, portée*; Ital. *estensione*. The aggregate of subjects to which a term, proposition, reasoning, inquiry, treatise, &c., refers or is intended to refer; the logical *breadth*. Cf. EXTENSION (in logic).

Whether it embraces real individual things external to the mind, or individual percepts, or general terms, is a question upon which there is no agreement among logicians. We may accept the statement of B. Erdmann that the aggregate of species constitutes the scope (Umfang) in the proper sense of the term; while in a broader sense it comprises the collection of single objects. (C.S.P.)

Scotism: Ger. *Scotismus*; Fr. *Scotisme*; Ital. *Scotismo*. The philosophic system and tendencies of Joannes Duns Scotus; opposed to Thomism, the system of ST. THOMAS (q.v., philosophy of). It is characterized by its tendency to separate philosophy from theology (see TWOFOLD TRUTH); its indeterminism, and emphasis upon will (see VOLUNTARISM); and by a movement in the direction of nominalism, although Scotus himself remained a realist. See TERMINISM, OCCAMISM, and REALISM (1). (J.D.)

Scottish Philosophy: see NATURAL REALISM, and REALISM.

Scotus Erigena: see ERIGENA, SCOTUS, and SCHOLASTICISM, I.

Scotus, Joannes Duns: see DUNS SCOTUS, JOANNES, and SCHOLASTICISM, II.

Scriptures [Lat. *scripturae*, from *scribere*, to write]: Ger. *heilige Schrift*; Fr. *Écritures*; Ital. *Sacre Scritture*. The sacred writings or books of any religion containing inspired and authoritative enunciations regarding doctrine, worship, or the conduct of life. In particular, the sacred writings of Judaism and Christianity as contained in the BIBLE (q.v.).

Literature: see BIBLE, and KORAN. (A.T.O.)

Scruple [Lat. *scrupulus*, a small sharp stone]: Ger. *Skrupel*; Fr. *scrupule*; Ital. *scrupolo*. Less important ground of moral hesitation; applied also to moral hesitation without ground. (J.M.B.)

Secondary (or **-darily**) **Automatic**: see AUTOMATIC ACTION.

Secondary Quality: see QUALITY AND QUALE.

Secrétan, Charles. (1818–95.) Educated at Lausanne, and studied at Munich under Schelling. After some years as lawyer and editor of the *Revue Suisse*, he became professor of philosophy at Lausanne (1841), Neuchâtel (1850), and Lausanne again (1866). Besides his work in general philosophy, he was a strong factor in French Protestant theology, and took a prominent part in the social movements of Latin Switzerland.

Secretion [Lat. *secretio*, a dividing]: Ger.